IMPLEMENTATION OF THE URANIUM MILL TAILINGS RADIATION CONTROL ACT OF 1978

HEARING

BEFORE THE

SUBCOMMITTEE ON NUCLEAR REGULATION

OF THE

COMMITTEE ON

ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

NINETY-SEVENTH CONGRESS

FIRST SESSION

JUNE 16, 1981

SERIAL NO. 97-H24

Printed for the use of the Committee on Environment and Public Works

U.S. GOVERNMENT PRINTING OFFICE
85-980 O WASHINGTON : 1981

S321-4

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IMPLEMENTATION OF THE URANIUM MILL TAILINGS RADIATION CONTROL ACT OF 1978

TUESDAY, JUNE 16, 1981

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON NUCLEAR REGULATION,
Washington, D.C.

The subcommittee met at 2:10 p.m., in room 4200, Dirksen Senate Office Building, Hon. Alan K. Simpson (chairman of the subcommittee) presiding.

Present: Senators Simpson, Domenici, and Hart.

Senator **SIMPSON**. Well, I am making my usual apology. I am sorry to be late. We had a bill I was involved with on the floor and then a very interesting meeting with the Secretary of the Treasury.

So, after all that good news, we might as well get into this good news, right, Mr. Senator?

Senator **DOMENICI**. Yes, sir.

OPENING STATEMENT OF HON. ALAN K. SIMPSON, U.S. SENATOR FROM THE STATE OF WYOMING

Senator **SIMPSON**. Good afternoon. We meet today to hear testimony from three panels of witnesses on a subject of particular interest to the members of this subcommittee—the regulation of uranium mill tailings activities.

In 1978, Congress enacted the Uranium Mill Tailings Radiation Control Act, establishing a framework for the stabilization, disposal, and control of uranium mill tailings located at active and inactive mill operations. Important responsibilities for the implementation of this act were conferred upon the three Federal agencies appearing here today: the Department of Energy, the Environmental Protection Agency, and the Nuclear Regulatory Commission.

Our purpose in holding this specific hearing is to review the progress of these three agencies in carrying out their respective responsibilities under the act.

As I look back over the last 2½ years, while I have been present in the Senate, I am pleased to note that some progress has been made toward the goals set forth in the act. The Nuclear Regulatory Commission has published its final implementing regulations, accompanied by a comprehensive three-volume environmental impact statement.

The Department of Energy has moved forward to designate sites and establish priorities for the cleanup and disposal of mill tailings located at those sites. And the Environmental Protection Agency has published proposed cleanup and disposal standards for inactive mill tailings sites.

However, there appears to me to be considerable cause for concern over the direction taken in the implementation of both the active and inactive programs that are mandated by the act.

In particular, the act calls for the promulgation of general environmental standards for inactive sites by November 8, 1979—now, more than a year and a half after that deadline, we still have no final standards. Similarly, the act established a May 8, 1980, deadline for general environmental standards for active sites—standards which have yet to be published even in proposed form. That type of activity is not conducive to proper regulation.

I am also quite concerned that the requirements imposed for the licensing and regulation of active and future mill tailings operations may result in limited benefits for the public health and safety, while imposing tremendous cost of the uranium milling industry.

In particular, I will be anxious to hear the views of the panelists concerning the relative costs and benefits of the 2 picocurie radon exhalation limitation, and the 3-meter ground-cover requirement. Are those adequate? Are they conservative? Are they workable?

Finally, as you know, the State of New Mexico has requested a 2-year extension of the November 8, 1981, deadline for adopting of a regulatory program which conforms to or exceeds the requirements set forth by the NRC. While this request raises certain issues unique to New Mexico which we will be carefully exploring today, I think it also provides a useful starting point for examining the progress made to date by other States in bringing their programs into line with the NRC's requirements. With this objective in mind, I will be particularly interested in hearing the views of the panelists concerning not only the steps taken to date by agreement States, but the steps left to be taken in the short period of time before November 8.

Once again, I welcome all of you and thank you for appearing before the subcommittee today. I am confident that your testimony will be of great assistance to the Congress as we examine this important piece of legislation

Before calling the first witness, I will certainly recognize a very fine participating member of this subcommittee and the full committee, the man with more duties to perform around this arena than any of us, the chairman of the Budget Committee, and I would appreciate any remarks you might have, Senator Domenici.

OPENING STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM THE STATE OF NEW MEXICO

Senator Domenici. Thank you very much, Mr. Chairman.

First, I want to thank you for calling these hearings. It is obvious that this is one of those situations that is in desperate need of an oversight hearing. While I am pleased that we are doing this, I am not so pleased with the progress that the Federal Government has made with reference to uranium mill tailings either inactive or active in terms of the regulatory process.

Much of the process involves setting of regulation at the national level and while some progress has been made in implementing the act, I have some grave reserves regarding the role of the implementing agencies and the regulations that have been issued to date.

I am particularly concerned, as you are, as you indicated in your opening remarks, that so much time has elapsed and EPA has made very little progress in establishing standards to protect public safety and the environment.

As you know, EPA was required, under the act, to promulgate standards for inactive sites by November 8, 1979, and for active sites by May 8, 1980. In April of 1980, EPA issued proposed cleanup standards for inactive sites and subsequently in January of 1981 proposed requirements for disposal of mill tailings at inactive sites.

The comment period for these proposed standards has been extended several times and the most recent deadline is June 26, 1981.

Their efforts to set standards for active sites have been even more disappointing. To date regulations have not even been proposed, and I look forward to learning more about the status of those standards, the proper implementation of a program for remedial and active sites requiring that EPA set these standards to assist both DOE and NRC in establishing the guidelines.

DOE progress on a program for remedial sites will be severely hampered if standards are not finalized soon.

On the other hand, Mr. Chairman, NRC has issued regulations for active sites which do not include appropriate input from EPA for the reasons I have just described.

Yet that input is required under the act. NRC regulations were published in final form on October 3, 1980, and are presently subject matter of litigation.

There is a further complicating situation which relates to the six agreement States. Mr. Chairman, my State happens to be one of those States which have indicated an interest in retaining authority for their own mill tailing program. Congress has repeatedly recognized they should retain and have that option.

The statutory deadline for those States to amend their agreements to meet NRC regulations is November 8, 1981. There is some question whether all the States will have in place a program to meet these regulations and my own State has requested an extension.

If the November deadline is not met an agreement State loses its authority and the program automatically reverts to the Federal program.

Mr. Chairman, I know you share with me great concern about that. If that is done by a State because they openly and intentionally opt out, that is one thing, but if they opt out in a manner that is almost forced upon them because of the failure on the part of the National Government to give them adequate time to develop their own program, as indicated in the facts which I have just described, and I would hope you would agree with me that is hardly opting out. It is somewhat of a coercive situation.

Given the amount of time that the agreement States have spent in putting in place their own programs, the lapsing of time available to meet the Federal guidelines and the transfer of the program would represent, as I just indicated, an unreasonable mandate.

Of equal concern is the fact that many feel that NRC is interpreting the act to require that an agreement State adopt a program identical to NRC regulations or its plan will be denied and authority will skirt from the States to the NRC.

If this is true, then NRC is not allowing the States, as provided under the act, flexibility to evaluate the NRC regulation in light of specific regional concerns.

My State has that specific problem right now. While each State may ultimately approve a program identical to the NRC guidelines, it is important that each have the time to thoroughly review its options before they are forced to finalize the plan which meets its own specific needs.

So, while we don't have a lot of time today, Mr. Chairman, I think that you know to my State this is a very viable issue. It obviously has some serious ramifications in yours, also, and in four or five others.

We already have a depressed uranium industry, you do also, with literally thousands of people out of work. We certainly have to be reasonable in terms of giving the State an opportunity to put the active mill tailings site program into effect, taking into consideration some national guidelines, but a program that they think meets the test of safety and economics. I am not sure that the present intention of NRC that they follow what they have and nothing else, I am not sure that does that, and I am not sure that would not cause further havoc in an already depressed industry without any significant health benefits.

I thank you, Mr. Chairman.

Senator **SIMPSON**. I thank you, Senator.

You and I do have the privilege of representing the two States, depending on whose books you are looking at, what particular time, that they are either No. 1 or No. 2 at all times with the production of domestic yellowcake.

It is indeed an issue, yet I don't think a provincial one because the issue of public health and safety is still paramount in all of my dealings, but I certainly feel somebody has to assure that oversight is here and that when the law mandates that something be done, that it be done, and that we get it done in the way which does not penalize those that have already done it.

We have with us now Albert Hazle, director, radiation and hazardous wastes control division of the Colorado Department of Health; and Cubia L. Clayton, assistant director, New Mexico environmental improvement division, accompanied by Al Topp, acting radiation bureau chief, please.

STATEMENTS OF ALBERT J. HAZLE, DIRECTOR, RADIATION AND HAZARDOUS WASTES CONTROL DIVISION, COLORADO DEPARTMENT OF HEALTH, AND CUBIA L. CLAYTON, ASSISTANT DIRECTOR, NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION, ACCOMPANIED BY AL TOPP, ACTING RADIATION BUREAU CHIEF

Mr. **HAZLE**. Mr. Chairman and members of the committee, I am Albert J. Hazle, director of the radiation and hazardous wastes control division, Colorado Department of Health. I have been employed by the Colorado Department of Health since 1965 in various capacities in the State's radiation control program involved with research and investigation and regulatory control. Colorado has been involved with uranium mining and milling problems since the early 1950's and became a U.S. Atomic Energy Commission's agreement State in 1968.

Appended to my testimony is a list of uranium operations, past, present, and envisioned in the future. Colorado has had the dubious honor of being involved with many of the negative aspects of the uranium industry including uranium miner lung cancer, surface and ground water contamination, drinking water contamination, and the use of tailings for offsite construction and land filling.

I would now like to address the four items which you, Mr. Chairman, have identified by a June 5, 1981, letter to Dr. Traylor, executive director of the department.

As stated previously Colorado became an agreement State in 1968, at which time regulatory control over uranium milling was transferred to the State by the AEC. Since the passage of UMTRCA—Public Law 95-604—the State with some assistance from the NRC has addressed the requirements of that act.

Specifically the State statutes have been reviewed and determined that no amendments are necessary. Current radiation control rules and regulations were found to be lacking in specific areas and appropriate amendments have been proposed for adoption by the State board of health.

Appended to this testimony are copies of the NRC comments on a version of the proposed revisions and the Colorado Mining Association's [CMA] comments on the version which will be considered by the State board of health for adoption on June 17, tomorrow. As can be seen by the statements made on page 2 of the CMA comments transmittal letter, CMA intends on "pursuing all available administrative and judicial remedies in challenging regulations which 'they' believe to be illegal or inappropriate." I additionally refer the committee to the referenced lawsuit between the industry and the NRC.

There are basically three options available to the board of health. First, adoption of the department's proposal with minor amendments thereby meeting NRC's regulatory requirements and allowing Colorado to pursue the amended agreement which should be accomplished if all entities act in a timely manner.

The second option for the board is to amend the proposal as suggested by CMA, which the NRC would most likely find as noncompliant with the requirements of UMTRCA and therefore preclude negotiation of an amended agreement. The third option would be for the board to defer action pending the outcome of the industry/NRC suit which. due to the time frames involved, would preclude an amended agreement by November 8, 1981.

UMTRCA requires the agreement States to implement the provisions of the act to the extent practicable prior to November 8, 1981. During the interim period—November 8, 1978, to present—Colorado has provided environmental assessments on the impacts from uranium operations, required hearings on licensing actions including transcripts and consideration of public comment, and provided for the protection of health, safety, and environment. The NRC and Colorado have been sued for allegedly not complying with these requirements and in accord with the decision of the Denver Federal court, the Sunflower Coalition has requested administrative review of the situation by the NRC.

The second item to be addressed is the matter pertaining to implementation of title I of UMTRCA.

In 1979, the Colorado General Assembly passed a bill authorizing Colorado involvement in the remedial program administered by DOE. The nine inactive tailings piles in Colorado have been duly designated by the DOE. However, no offsite properties have been designated in Colorado to date.

We currently estimate that about 7,000 such locations may be eligible for consideration in Colorado, primarily in Grand Junction, which do not fall under the authority of Public Law 92-314. While a cooperative agreement has not been signed at this time, negotiations are being pursued. Colorado has adopted four policies for its use in addressing certain matters. These are also appended to this testimony.

A State disposal site review process was used and the information provided to DOE for their use in designating the ultimate disposal location. With the provision of equipment from DOE, Colorado is working with local government building permit programs to preclude new construction on contaminated sites, thereby reducing increased costs to the program in future remedial actions.

Remedial action on Colorado's high priority tailings piles—Durango—should proceed in late 1983 or shortly thereafter. Of concern to Colorado is the division of authority over various aspects of the program which has, in our view, delayed action on some locations beyond that accomplished by funding, program administrative development, and program criteria and standards.

From our past experience in the Grand Junction program, once these initial efforts coalesce and the UMTRAP and DOE headquarters take a back seat in program operations, progress will be more in evidence.

With regard to the third item of the subcommittee chairman's letter, Colorado feels the NRC regulations adopted to implement UMTRCA are reasonable and appropriate in light of our past experiences and due to the latitude provided in the regulation. These regulations were adopted on the basis of the GEIS on uranium milling which had its origins in an NRC branch position dated May 13, 1977.

Colorado has used the 1977 NRC position in the licensing decisions prior to the availability of the GEIS and the NRC regulations. The issuance of the Cotter Corp.-Canon City license amendment was based on the 1977 NRC branch position and Colorado statutes and regulations. The issuance of the Homestake Pitch project license was based on the criteria as stated in the NRC regulations and Colorado requirements. The department, along with other agencies of the State, has been sued by the Gunnison Valley Alliance and the Colorado Open Space Council for their authorizing decisions. Neither Homestake nor Cotter has requested administrative or judicial relief from the conditions of licensure imposed to meet the requirements of NRC and the agencies. While there is a definite fiscal impact from meeting these requirements, the cost-of prevention is far less than the cost of remedial action.

On the matter of EPA authority and its involvement, while EPA has been tardy in its timely provision of general standards, we feel their involvement as provided by law is appropriate. Also appended to this testimony are our comments on their proposed standards.

Our main concerns involve national standards which are inappropriate to specific situations and require extensive use of exception provisions to allow a cost-effective program. Probably more important is the DOE procedure for implementing EPA general standards. Of absolute necessity is the need for the standards implemented to be the same for both active and inactive sites—title I and II—as the potential hazards are basically the same.

While EPA may be late in providing standards as required by law, NRC and DOE, in consultation with EPA, have proceeded prudently, although not expeditiously, in the implementation of the act. Removal of EPA authority, while allowing expeditious progress, does not provide for the necessary input envisioned in the act.

I would say, rather, fund EPA specifically and adequately for the task as charged.

As a general matter of interest, I am providing a copy of my presentation of June 12 to the uranium law seminar which addresses in detail many of the items addressed in this testimony.

Finally, due to the nature and timing of these hearings and the hearings of the State board of health on June 17, I would request the keeping of the record open in Colorado's case pending the decision of the board on the proposed regulations. Should the board take an action that would preclude an amended agreement by November 8, 1981, Colorado would be forced to request amendment of UMTRCA for an extension of time as suggested by the State of New Mexico.

This concludes my prepared testimony and I stand ready to respond to any items the subcommittee wishes to be addressed.

Thank you.

[The attachments to Mr. Hazle's statement may be found at pp. 22–79.]

Senator Simpson. You have set a pattern for all the people who will testify today as the time runs from the glass.

Thank you so much. I appreciate your testimony.

And now, Mr. Clayton, sir.

STATEMENT OF CUBIA L. CLAYTON

Mr. Clayton. My name is Cubia Clayton. I am assistant director in the environmental improvement division of the New Mexico Health and Environment Department. I am very appreciative of the opportunity to appear today and discuss with you some of the problems we are having with the implementation of Public Law 95-604, the Uranium Mill Tailings Radiation Control Act of 1978.

New Mexico has made substantial progress toward implementing the requirements of the Uranium Mill Tailings Radiation Control Act. We believe it extremely difficult if not impossible to fully comply by November 8 of this year. It is our opinion that a 2-year delay in final implementation would be desirable and most likely essential if we are to be in position to negotiate an amended agreement.

Our difficulties spring from a multitude of causes. These include the failure of the Environmental Protection Agency to develop the mandated standards in a timely fashion given the time constraints in the act.

There are also problems in our opinion with the practicability in New Mexico of some of the regulations promulgated by the Nuclear Regulatory Commission. There is a problem of uncertainty as to what the final regulatory requirements will be considering that the present regulations are under adjudication.

Finally, there is the problem of complying with New Mexico's statutory requirements and regulatory philosophy within the time remaining.

The New Mexico Environmental Improvement Act and Radiation Protection Act establish the procedures by which environmental protection regulations are to be adopted in New Mexico.

Under the authority of these statutes there has been created a five-member board, the environmental improvement board who are appointed by the Governor, and a seven-member group, the radiation technical advisory council composed of technical experts from industry, national laboratories and private consultants who are also appointed by the Governor.

For purposes of radiation protection, regulations are adopted by the environmental improvement board with the advice and consent of the radiation technical advisory council.

Before adopting regulations, the board must hold a public hearing advertised at least 30 days in advance. At the hearing anyone who wishes may testify and anyone who wishes may crossexamine. The board then adopts its regulations based on the record giving the weight it deems appropriate to all facts and circumstances including but not limited to:

First, the character and degree of injury to, or interference with health, welfare, animal and plant life, property and the environment; second, the public interest, including the social, economic, and cultural value of the regulated activity and the social, economic and cultural effects of environmental degradation; and third, technical practicability, necessity for and economic reasonableness of reducing, eliminating, or otherwise taking action with respect to environmental degradation.

I apologize for the amount of time I have taken to explain the procedures used in New Mexico, but it is necessary to a full understanding of some of the problems.

I would hope that the committee will perceive that adopting Federal requirements in our State is not merely a rubberstamp process. Even though a Federal agency may feel it has adequately considered all issues and developed good regulations and standards nationally, they must still be justified through the State processes.

For the past 10 years or so, we have been able to justify minimum national standards for the complete range of environmental protection programs. In most cases, we have gone far beyond minimum Federal requirements by justifying the need and desire to fully address our specific problems.

In a few instances we have relied on the fact that a minimum standard must be adopted in order to retain State authority. Despite the unpalatability of this approach, the board has usually accepted the fact as compelling when weighed against all other facts and has adopted the standard.

There is a strong desire in New Mexico to retain State authority in these programs, Mr. Chairman.

There is some reluctance to do so with the new requirements for regulating uranium mill tailings. This reluctance is based in part on the Federal failure to follow a sound regulatory approach. It is based in part on the failure of the Nuclear Regulatory Commission to adopt realistic minimum national standards particularly in relation to mills which have been generating tailings for a period of 20 or so years, and the reluctance is based in part on the uncertainty created by the litigation of the Nuclear Regulatory Commission regulations and the perception in New Mexico that the litigation will be or should be at least partially successful.

This is not to say that we have done nothing toward complying with the requirements of the act. We were already working on extensive revisions of our radiation protection regulations in 1978 prior to the adoption of the Uranium Mill Tailings Radiation Control Act. Following adoption of the act, we found sone further revisions were necessary. Those revisions included such issues as performance objectives, surety bonding, stabilization, landownership, and buffer zones around tailings piles.

The regulations were taken to hearing in May 1979. The hearing lasted 6 days and resulted in 3,000 transcript pages of testimony.

The environmental improvement board adopted and filed on April 21, 1980, regulations which included all but a few of the requirements finally adopted by the Nuclear Regulatory Commission in the fall of 1980. Significantly, some of the requirements which the board considered but did not adopt have become issues which are presently the focus of litigation.

Efforts to improve our program have not been limited to regulatory reform. We have also recognized the need for additional manpower. Our technical staff for uranium licensing in 1977 consisted of one person. At present there are seven which include two with Ph. D. degrees, four with master's degrees, and one B.S. degree. These 7 include a total of 163 manyears of professional experience with nearly 100 years of professional experience in radiologically related fields.

We believe this evidence is ample to demonstrate our interest in retaining State regulatory authority over uranium mill tailings, and further that there has been a good faith effort on our part to comply with requirements of the Uranium Mill Tailings Radiation Control Act. The fact that this much progress could be made and still leave the State in the position of not being able to fully comply by November 1981 should serve as a warning that some adjustment is necessary.

Let me then turn to a consideration of some of the specific difficulties which have occurred to date beginning with the impropriety of the regulatory approach. A sound approach to regulation consists of first establishing standards based on limitations necessary to protect public health and welfare.

One then implements these standards by regulations designed to insure the standards are not exceeded. Unfortunately, the Environmental Protection Agency has not yet established its standards, but the Nuclear Regulatory Commission has promulgated regulations which in the absence of a specific standard appears to be based on the use of the ALARA principle in lieu of such standard. This approach may be feasible for new mills and, in fact, there is some evidence that it will work; however, it seems disastrous when applied to existing mills in New Mexico.

For instance, assume that one knew in advance that below grade disposal with long-term stabilization of tailings was the requirement to be met. A plan could be formulated at the outset to accomplish this in the most cost-effective manner. Thus, one would select a site whose geology was most amenable to natural protection from seepage, runoff, erosional potential, and a myriad of other considerations. This is far different from dealing with a pile some 80 feet high, covering over 200 acres in an area which was located initially because of proximity to a mill and ease of tailings deposition.

I do not mean by my comments to be totally disparaging of my fellow bureaucrats. By and large the individuals in both the Environmental Protection Agency and the Nuclear Regulatory Commission whom I have known are conscientious and dedicated public servants.

A large part of the problem, in my opinion, lies in the fact that regulations for a particular complex and difficult area have been required in a very limited amount of time. To respond to the 3-year congressional requirement with rational and well-considered regulations was probably never really possible.

This is not to say that efforts to date have not resulted in significant progress. As I have previously indicated, the final Nuclear Regulatory Commission regulations with but a few exceptions appear feasible for new uranium mill operations.

They have been applied in New Mexico, again with but a few exceptions, in the last two mill licenses issued by the environmental improvement division. Both of these licenses reflect real improvements in the technology of tailings management as well as improved regulatory control.

What is needed now is time—time for the Environmental Protection Agency to develop a legitimate standard, time for the Nuclear Regulatory Commission to reflect on necessary refinement and better balance in its regulations; time to adjudicate those issues which may not be resolved otherwise, and time for the whole process to work so that agreement States can know what the requirements shall be.

I would suggest that the last sentence of section 204(h)(3) of the Uranium Mill Tailings Radiation Control Act of 1978, as amended, be further amended to provide a 5-year period rather than 3 years as it does presently. This, in my opinion, is the least possible, but absolutely essential, adjustment.

Senator SIMPSON. Thank you very much, Mr. Clayton.

Let me ask a few questions.

Senator DOMENICI. Mr. Chairman, before you do, could I make an observation?

Senator SIMPSON. Please.

Senator DOMENICI. I recall, Mr. Clayton, there was a great deal of concern in this committee as to whether we could ever get EPA, NRC, and DOE to all synchronize their work and come out with something at the same time and in sequence. I recall also we were very concerned about the timing, whether it could be done. We received assurance from EPA that it could. As a matter of fact, I have before me the record of our House counterpart committee. On page 128 of the House transcript, EPA, through Mr. Hawkins, indicated this would be a very easy situation; he indicated to the committee that he could do it in 6 months. It isn't done yet, as I understand it, 2½ years later.

So, I want you to know, we didn't pull the timing out of the air. It turns out you were right and they were wrong.

I also want to commend you for the position you take, if we were going to have agreement States and have environmental boards and environmental establishments in the State, they shouldn't be rubberstamps for the Federal bureaucracy and I don't think you ought to be embarrassed to tell us that. We were better concerned if you didn't have any experts and wouldn't be putting anything in the program.

From my standpoint, I am pleased you take that position and I am glad you told the committee why New Mexico feels that way and what you have done.

Mr. CLAYTON. Thank you.

Senator SIMPSON. There would be an opportunity for further questions on your behalf, too, Senator Domenici.

Senator DOMENICI. Thank you, Mr. Chairman.

Senator SIMPSON. Is it the position of both States, New Mexico and Colorado, that you wish to retain the authority to license and to regulate uranium mills and mill tailings as the agreement States?

Mr. HAZLE. That is correct.

Mr. CLAYTON. Yes, sir, that is correct, Mr. Chairman.

Senator SIMPSON. To what extent do your States now meet the new requirements of the Mill Tailings Act for agreement States other than the requirement to adopt full regulations equivalent to the extent practical or more stringent than the NRC regulations and the EPA standards if and when they become available?

What will you be doing to meet the new requirements other than those? In other words, do you anticipate any difficulty in meeting the other requirements that would have to do with requirements for public hearings or foreign environmental reviews and related staffing, this kind of thing?

Mr. CLAYTON. Mr. Chairman, if I may, I think that we envision no other difficulties than this final bunch of regulations. As far as the other requirements are concerned, I believe we can comply with them.

Mr. HAZLE. As far as Colorado's position, basically the same situation, that we do have all the other requirements in place, we await a review of programs as required under NRC's criteria for agreement States and the only thing that really remains is the major roadblock, the option of public regulation.

Senator SIMPSON. Would you agree that under the Mill Tailings Act that the appropriate regulation setting authority within the State has the right to conduct a detailed evaluation of the new NRC regulations and the EPA standards required by that act to determine whether those regulations and standards are practicable, given the local conditions in your State before adoption of the required State regulations and the standards needed that will be required by you as an agreement State.

Mr. CLAYTON. Mr. Chairman, that is clearly one of the issues being litigated right now. We have not taken a position on that litigation. However, it is my opinion that if the law is not properly construed that way, it ought to be.

Mr. HAZLE. Mr. Chairman, in Colorado State statutes, there is a requirement to adopt no more nor less stringent requirements than are in the suggested regulation control rules and regulations. These are prepared by the conference radiation control director.

If there is a deviation it must go through a finding-of-fact process. So, as these particular regulations have not been incorporated into the suggested State regulations, we do have to go through a detailed exercise before the State board of health.

Senator SIMPSON. To what extent are those detailed evaluations being conducted within your States?

When are they likely to be completed?

Are they likely to result in substantial differences between the State regs and the NRC regulations?

Mr. HAZLE. Mr. Chairman, in the case of Colorado, our hearing is tomorrow on these regulations. I do not anticipate a decision until probably a month, their next meeting. And it would be inappropriate for me to venture a guess as to exactly how that hearing will come out.

Senator SIMPSON. Mr. Clayton, do you have any response?

Mr. CLAYTON. Mr. Chairman, we have just concluded most of the hearing last weekend in New Mexico. The record has been left open to receive additional testimony. It is likely to be 60 days at least before the record is closed on that and the board will have to review the transcript and make a determination.

I did detect an inclination on the part of the chairman, and I think other board members as well, to consider very seriously the prospect of returning a program to the Federal Government rather than adopting requirements they felt would not be tolerable in New Mexico.

I am prejudging that a bit and giving you my impression.

Senator SIMPSON. Very interesting.

Is it possible that the additional State evaluations that you will make will be needed when the EPA finally does promulgate its general environmental standards for milling and mill tailings?

Mr. CLAYTON. I think it depends on the kind of standards EPA promulgates. One of the real problems we have in New Mexico limitation, it is simply nonsense when one looks at natural background in our State. It would be providing a greater level of protection for people over tailings pile than if they built their home over natural outcrop.

If EPA persists in following that particular standard, I think we are going to have a lot of trouble with that, too.

Senator SIMPSON. Do you have any response?

Mr. HAZLE. Yes, Mr. Chairman. I understand that in working on these NRC regulations, the NRC did have some contact much before then with EPA in the development of that criteria. And the standard was basically developed to the NEPA process and EPA did participate in the review of the generic and environmental impact statement.

Senator SIMPSON. In making its decisions to approve or disapprove State mill tailings regulatory programs, to what extent does the NRC have the authority under the act to review any State judgment that a particular NRC regulation or EPA standard is not practicable based upon local conditions within the State?

Mr. CLAYTON. Mr. Chairman, what authority they have may well be to focus litigation in the future if they persist in the view which they now have that the State must adopt these regulations.

There is no latitude.

Now, in the course of the hearings in New Mexico, it appeared that view was a bit more flexible than we had been led to believe in the past. Truthfully, I do not know what flexibility NRC has nor how much they will choose to consider.

Mr. HAZLE. Mr. Chairman.

Senator SIMPSON. Yes, Mr. Hazle.

Mr. HAZLE. I think the question revolves around the definition of equivalency. And I think if you can resolve that issue, I think that will be to the best advantage of all concerned.

Senator SIMPSON. Equivalency and duplication not being similar terms.

Mr. HAZLE. Yes, sir.

Senator SIMPSON. One more question and then I will defer to my colleague.

If the Congress granted an extension for the development of amended agreements for State regulation of mills and mill tailings along the lines of your request, at least with respect to the adoption of equivalent regulations and standards, will this recreate a situation in which mill operators in the agreement States will come to enjoy a competitive advantage over mill operators in the nonagreement States who are already subject to the new NRC regulations? If so, what solution do you see to avoid that potential competitive disadvantage for operators in the nonagreement States?

Mr. CLAYTON. Mr. Chairman, it is possible. And it is possible there might be some economic advantage. I am truthfully not familiar enough with conditions in other States to respond to that question intelligently.

It would seem appropriate to me if Congress found an extension of time to be in our best interest, that they could provide for suspension of the regulations. In New Mexico it would be, I think, particularly useful for those mills which were existing and in operation prior to the passage of UMTRCA. Now, for new mills, as I said, I think there is some reasonable argument to be made that new mills can meet these requirements.

It really becomes extremely difficult when you are talking about existing mills that have operated for 20 years or so. So one of the things you might want to consider is suspending the regulations for existing facilities or those which were in existence prior to the adoption of UMTRCA. Certainly, I think you might want to consider suspending them in both agreement and nonagreement States.

Senator **Simpson**. I think that is a very definite possibility. Do you have a response?

Mr. **Hazle**. I cannot address the economic advantage. But in the case of Colorado, we have in the absence of Federal regulation or standard used the NRC branch position of 1977 and the generic environmental impact statement as a basis for licensing decisions and have proceeded along that way with Cotter Corp. and with Homestate Pitch projects. In that regard, those two operations as licensed would meet the NRC requirement.

So, we would intend on moving forward even though we could not maybe make the deadline and if there was an extension provided, it would be from our vantage point all right.

But the economics I really couldn't address.

Senator **Simpson**. Thank you.

I would, now, even though we have a ruling in the committee that the first one that shows up gets to participate, I did not get the opportunity to recognize Senator Hart who is the ranking minority member of this subcommittee, and he may have a brief opening statement and then we will come back to Senator Domenici for questions.

I will introduce Senator Hart to you.

Senator **Hart**. Thank you.

Senator **Domenici**. Mr. Chairman, I would just as well you proceed with questions in addition to your opening remarks. I will follow you.

OPENING STATEMENT OF HON. GARY HART, U.S. SENATOR FROM THE STATE OF COLORADO

Senator **Hart**. I want to welcome the witnesses, and particularly Mr. Hazle from my own State.

As one of the original sponsors of this legislation along with the Senator from New Mexico, I think, along with others, that the last thing that we had in our minds 3 years later is that we would be here holding this hearing. One of the frustrations of public life is to try to solve the problems. I think that based on the hearings held and the testimony taken and the staff work done, that you come back 3 years later and find out the people are saying we need delays and we need to try something else. So I must say I am very frustrated both as a Coloradoan and as a member of the committee that we have not done better here. I suppose what we ought to do is try to figure out why and see that it doesn't happen.

Second, I am concerned, if given the pattern of EPA delays, the correspondence I have had with former administrators urging promulgation of regulation by certain dates, those dates being missed by as much as a year, why that happened and whether given the current attitude to cut back on the staffing of EPA and the budget of EPA, what effect that would have on getting this job done. Are we in fact going in two different directions at the same time? That is the concern I have had with accelerating nuclear licenses, too. Can you reduce the staff and authority of EPA at the same time you are asking them to move faster?

Finally, Mr. Chairman, I am concerned about, not only the performance of State and Federal agencies, but also industry. I am disturbed by an industry organization letter to our own

Department of Health stating its intention, "To pursue all available administrative and judicial remedies in challenging regulations which we believe to be illegal and inappropriate."

Obviously you ought not do that, you should not try to comply with anything you think illegal. What is inappropriate bothers me. It seems to me that the industry, after 3 years, ought to figure out a way to make this thing work, not a way to stall it further.

I want to find out further how much of this is general industry resistance of what is illegal, and whether the industry is setting itself up as a public arbiter of what is appropriate.

The word inappropriate bothers me a lot. The industry does not decide what is appropriate for public health; the Congress of the United States does.

If industry is in the posture of deciding for itself what is inappropriate for the people of this country, I think this committee ought to find that out.

Now, having said all that, Mr. Hazle, is a time extension necessary for the State of Colorado?

Mr. HAZLE. We hope not. However, with the hearings set for tomorrow on the regulations to meet equivalency of the NRC provisions, it remains to be seen and I have requested in my testimony that the record be left open so that I can provide input as to what the Board of Health does tomorrow.

Senator HART. I take it from your statement before last, that you believe that mill operators in Colorado can reasonably comply with this regulation that you promulgated?

Mr. Hazle. We have in the past and I would hope so in the future.

Senator HART. In that context, could I ask the representatives of the State of New Mexico, what is different about the New Mexico situation from Colorado and why is the State of New Mexico, as far as I am aware, the only State of the agreement States which is seeking an extension? Is there a factual difference about your State that I don't know about?

Mr. CLAYTON. Mr. Chairman, Senator Hart, I would have to speculate a bit to respond to that question. I will be perfectly happy to do so for you.

I think there are significant differences between New Mexico and any other agreement State. We produce half of the uranium that is produced in the country. Our mills are considerably larger than any other—any of the mills that I am aware of in other agreement States—Texas, for instance, has practically none, I think they are almost all in-site operations. It is probably not too difficult to comply in that case.

Our smallest mill is larger than the model mill that is used as the example in the GEIS.

We don't strip mine with the exception of the Jack pile mine which has just recently shut down for uranium in New Mexico. They are all deep mines.

When you talk about going back and disposing of tailings that have built up, it is not a case of simply trucking them over to the nearest strip mine area, dumping them and then covering them over, it is far more extensive than that. Those are some of the probable reasons. I don't know that they are the specific reasons.

Senator **Hart**. Essentially your answer is you do and have done quantitatively more uranium mining than any other State and you generally have done a different type of mining that makes it more complicated to regulate; is that right?

Mr. **Clayton**. Yes, sir.

Senator **Hart**. Mr. Chairman, I have some other questions but I appreciate Senator Domenici deferring.

Senator **Domenici**. Thank you, Mr. Chairman.

Senator **Simpson**. Thank you, Senator Hart.

Senator **Domenici**. On the active sites, my questions will deal with that.

As I understand it, Mr. Clayton, the major problem we have is that EPA did not promulgate a standard but NRC promulgated a regulation that is very specific. It requires that not less than 3 meters of earth cover be placed over tailings or waste at the end of a milling operation to result in a calculated reduction in surplus escalation, and then they have the 2 picocuries per square meter per second.

As I understand New Mexico's problem, if you look at the basic law, that we draw and decide from your constructive criticism that we didn't have a standard drawn before the regulator regulated, we have a statute that says for the agreement States that they are, to the extent practicable, to comply in their arrival at an equivalent at least minimum standard. And it is there that you are running into trouble in the interpretation. Is it that there can be no deviation from what I just read? That means to the extent practicable it has no meaning as it applies to that definition because it is that or nothing. And if I understand, that may cause New Mexico to say you do it, we won't because we think that is unreasonable.

Am I reading you right?

Mr. **Clayton**. Yes, sir.

Senator **Domenici**. You mentioned a while ago in response to Senator Hart that we have a difficult problem with this because we mine differently. We do not have a strip that we can put it in and put the 3-meter cover on, but you also mentioned it might be unreasonable because the acceleration of 2 picocuries might be unreasonable in New Mexico.

You mentioned something about outcroppings and you find this level in many places where we have no activities at all. Can you explain that to the committee?

Mr. **Clayton**. I wish I could explain it really well, Senator. We have done monitoring in New Mexico. I am sure you remember that the New Mexico Legislature funded a $100,000 study about 3 years ago. We expect all of our results in and the study to be completed this fall. I don't have specific values from specific outcrops. But just from the basis of the study that we have done in the grant area to date, it appears that 2 picocuries is far lower than we are seeing from natural background levels, if you wish, in many areas out there.

I don't have really good specific values for you.

Senator **Domenici**. So if I understand you correctly, what New Mexico is saying is that they seriously desire to remain an agreement State, that they have taken that position before, and they would like to continue. But generally, it is your opinion that if there is no flexibility on the regulation that I just read, that probably the State would feel they are in a futile position, in reference to their own experts, in arriving at their own minimum and probably abandon it and give it back to the Federal Government.

Mr. CLAYTON. I hate to make that kind of prediction but I think that is quite likely. That is based on my perception on the way the Board and Radiation and Advisory Council received that information.

Senator DOMENICI. Mr. Clayton, you mentioned the two levels, the Board and the technical group; is the technical group looking at some New Mexico regulations that would ultimately be New Mexico's proposal as their intended regulations so they could remain an agreement State.

Mr. CLAYTON. Mr. Chairman, Senator Domenici, we have already adopted the majority, say, 98 percent of the regulations. The ones that are under review right now, they have been reviewed by the Council, they were considered by the Board at the hearing over the weekend. Now the Board and the Council will get together, this is where the advise and consent comes in, and come out with some final adoption. I don't know exactly how that process is going to work because we have just recently had a decision in the Court of Appeals that changed the procedural way we have been dealing with it. But there will be an element of advising and consenting by the Council who are specifically there to look at the more technical aspects.

The Board's job is broader, as I indicated in my statement. They have to balance a lot of considerations.

Senator DOMENICI. But, if New Mexico, with their own technical team, was attempting to provide a measure of health protection, that was at least minimum to the States.

The point I am trying to make, as to this one specific, they would come up with an option that they thought New Mexico's uranium industry could live with that would protect the public health but they don't have any flexibility with the present interpretation; is that correct?

Mr. CLAYTON. Yes, sir, that is exactly correct.

Senator DOMENICI. Now, do you work with EPA also?

Mr. CLAYTON. Yes, sir, I do.

Senator DOMENICI. Have you had discussions with them on whether they intend to promulgate their standard here?

Mr. CLAYTON. I don't have a specific date, I am sorry.

Senator HART. Would the Senator yield for questions?

Senator DOMENICI. Yes, sir.

Senator HART. Would the Senator rephrase or restate again what the reference to this interpretation was?

Senator DOMENICI. As I understand it, Senator, NRC is saying that regardless of what the law says with reference to an equivalent to the extent practical or more stringent than, that their interpretation now is since they have no EPA standard, it will be this or nothing else.

Senator HART. Have they written that down anywhere?

Senator DOMENICI. I don't know if it is in writing. It was my understanding in talking to New Mexico that is their position.

Mr. CLAYTON. Mr. Chairman, I think we can provide a letter from Mr. Wayne Kerr to the Governor of New Mexico pointing out exactly what we need to do by way of adoption of regulations. It is the same.

Senator HART. So that phrase doesn't mean anything, "the extent practicable," in your judgment?

Mr. CLAYTON. Giving that no weight at all that I could tell.

Senator DOMENICI. I have no further questions.

Mr. HAZLE. Mr. Chairman.

Senator SIMPSON. Yes, Mr. Hazle.

Mr. HAZLE. There is one other issue that has not come up in this hearing. Mr. Clayton did address it briefly with regard to existing mills. We have had two problems in our State which we inherited from the AEC, one is the Cotter Corp. mill, in Canon City, they have ground water contamination, and the Cotter Corp. has instituted a remedial action program removing those tails and putting them into a new impoundment at their expense.

In the case of Uravan, a Union Carbide operation, our concern here is whether that mill is closed, and they only have 2½ years' nominal operations left in that tailings impoundment, when that mill is to be reclaimed, we would then anticipate turning that stabilized impoundment back to the NRC.

At the time of termination of that license, we cannot terminate that license until NRC agrees that that has been stabilized in accordance with their requirements. And we are currently working with Union Carbide to come up with a reclamation plan, and to date NRC has verbally agreed to the stabilization basis. Union Carbide has yet to submit the plan to meet that requirement, although we are getting close.

The point here is that NRC has the last say on any termination of any agreement State license and there might be a little arm twisting as to making sure that we can transfer this but it will have to meet NRC requirement.

I have a bit of concern as to how much arm twisting they can do.

Senator SIMPSON. We will find out, hopefully. And I thank you. That issue of equivalency which now is being shaded into the issue of duplication in violation of the statute is something we are going to pursue and part of it right here.

I thank you very much.

Do you have any further questions, Senator Hart?

Senator HART. One or two brief ones, Mr. Chairman.

I would like to ask Mr. Clayton, I think the original question I asked was the reason for New Mexico being the only agreement State seeking an extension. The answer was the different kind of mining and a lot more of it.

Really the question is, Does either of these account for the need for an extension to promulgate regulation?

Mr. CLAYTON. I am sorry, I didn't get the question.

Senator HART. My question was, the need for delay and the answer was, because of the volume of mining done in the State and the type of mining done in the State, as I understand what you said. But the real question was, how does that account for a delay in promulgating regulations, not in compliance, but in promulgating regulations?

Mr. CLAYTON. Senator, I think it would make ever so much difference to our Board if the ending litigation had been resolved, if the courts determined that in fact NRC is not interpreting properly, then New Mexico would proceed about its business trying to adopt those standards it felt to be realistic.

If, on the other hand, NRC is successful and prevails in court, I suspect that when it comes right down to it with no prospect of any sort of relief and it is do this or turn the program back, the Board might find that a bit more persuasive than they do right now.

One of the problems we have is that I think the Board perceives, either correctly or incorrectly, that there is at least a strong possibility that some of these regulations will be struck down, that additional time will allow time for that situation to resolve itself.

Senator HART. I guess my question is, why did Colorado not follow that procedure, Mr. Hazle?

Mr. HAZLE. Our procedure is set up differently under State law. But we feel at least our past experience with the industry is that it looks like we can make it provided something doesn't hit us through the blind side.

Senator HART. Has your experience been that NRC has been inflexible and rigid?

Mr. HAZLE. In the case of Uravan, this is an existing mill to meet the full absolute requirements of the criterion they would have to move the 10-million tons of tails and put an impervious liner on it. The review by the NRC and their consultant does not include moving that tailings pile, but dewatering it, recontouring it to allow for erosional patterns on the cliff base, and the cliff retreat to meet a standard of 10,000 years for the reclamation effort.

So from that standpoint, it depends on the circumstances of the specific situation that you are trying to address, and whether it is reasonable to apply the standard under that specific situation.

Senator HART. Mr. Chairman, I think we have to find out why NRC has been reasonable in one State and unreasonable in another.

Senator SIMPSON. I concur.

I have one question of the State representatives.

How many of those mills are presently in your States? How many cases will disposal of the mill tailings be required of the site other than the location where the mill is located? In other words, if we are going to find this need to relocate mill tailings directly to the rate of emission, earth cover, ground cover resources? If so, is there a level at which those requirements can be met that adequately protects the public health and safety but reduces the need to completely relocate mill tailings pile?

Mr. CLAYTON. That is a very difficult question for me to answer right now, Mr. Chairman.

It may be a measure of some of the difficulty that we have. For instance, take one of the larger piles, the Kerr-McGee pile which I believe now covers approximately 200 acres at a height of something like 80 feet, if you start talking about 3 meters of cover, 10 feet of earth cover for a pile that size, you are talking about stripping an area in New Mexico that would put some of our coal mines to shame and then you got reclamation of that area as a result of trying to reclaim the tailings pile. Moving, it seems to me, is a monumental job. I don't know how it would be done. It is possible that some of the sands after backwashing could be slurred back to the mine again, but I don't know and I am not sure that is really a reasonable alternative.

Senator SIMPSON. Thank you for your response.

Mr. HAZLE. Of the nine inactive sites, which come under title I, we anticipate four of those would have to be relocated—Durango, Grand Junction, Gunnison, and the two piles at Rifle.

With regard to the active sites, Cotter Corp. at Canyon City is relocating those tailings because of the ground water. In the case of Uravan, 10 million tons, we envision stabilization in place but a number of requirements in the reclamation of those actual tailings which will have to be accomplished.

Senator DOMENICI. Mr. Chairman, I think your question with reference to active mines and having to move mill tailings to another site goes right to the heart of the issue. If I read what New Mexico is saying, there are a number of such piles on active mines that if you had to comply with this regulation, there is practically no way to do it other than to move to another site and that State is trying to explore, under the protection of the agreement State, an alternative which would make the regulation applicable, to the extent practicable, and that in some of those instances they want some leeway to find that it is not practicable to do that.

That is why I don't think they are treating States differently. I think the State has a different problem as described here. If you only had, for instance, to compare the active ones to the inactive ones on the one hand to acknowledge that the Federal Government is going to pay for one and the other you've got to have an ongoing operation that will do it. I think we are going to be shocked when we hear future testimony and when we hear what the Energy Research and Development Subcommittee is taking testimony about, whether the Federal Government is going to pay the price under the existing regulations for the inactive one.

I understand the price of that is going, if not into the billions at least half a billion when we thought it was a few tens of millions. But that is one where we are saying the Federal Government is going to do it. We have a situation in New Mexico where they are saying to us, give us a chance to promulgate some regulations that we think will protect the health and do not require that these ongoing sites find 10 meters of earth on top of them to meet that standard. They are saying, we don't think we've got that flexibility—if I understand them correctly. This doesn't mean that State is approaching the difference, they are looking at the practical consequence of interpreting that way and no other way.

Another State might find they do not have that problem for one reason or another. I don't think it is fair to compare the inactive sites to the active ones in terms of the practicableness of it, although we may end up applying the more practicable test before we get through. We may never get one to appropriate the money even for the inactive ones.

That isn't the major issue in this point.

Gary, I think our State really feels they need more time and they need EPA to promulgate their standard so New Mexico can take a bona fide look at whether they want to enforce it or not. I think they are saying if we have to enforce this and nothing else, good luck, you try it, if I read it right. I think we will find the same problem in the Federal Government. Are they going to close it all? Are they literally going to go into our State and close them down?

I do not think we ought to cast it aside easily and say, let the States do it. They will have the same practical problem that they are having and that your Board is having. And I understand that the Board has raised the issue, is that not correct?

Mr. CLAYTON. Yes, that is where the problem is right now.

Senator DOMENICI. They are the board appointed by the Governor that ultimately adopts the regulations that you have described in New Mexico, a detailed approach, and they are trying to handle this one the same way, the full hearing, advice from the technical people, advice and consent from the technical team, and they are having a great deal of difficulty with this specific one.

Mr. CLAYTON. Yes, Mr. Chairman. Let me make the point that the board already adopted in 1980 the vast majority of the regulations. They are having a problem with the 2 picocuri, they are having a problem with the 3-meter earth cover, and they are having a problem of not allowing industry the option of self-surety.

Senator HART. Are they having a problem among themselves or are they having a problem with NRC?

Mr. CLAYTON. Mr. Chairman, under our law, our agency, the environmental improvement division is the administrative agency—some problems with interagency cooperation, and so forth, operate at the administrative level, there are some problems there, as I have indicated. There are problems in the way NRC interprets what must be done versus the way the division does.

The body which adopts the regulation is the board. There is some problem possibly with our inability to persuade the board it must do this when it hears testimony that it puts great weight on that says it is not practicable to do all this.

So you've got several levels of problems.

Senator HART. Mr. Hazle, you were talking about active sites.

Mr. HAZLE. The mill at Uravan is an active site although temporarily it is shut down because of the economic situation on uranium. The Cotter Corp. site is operational, however, it is at half process flow because of economic situations.

Senator HART. OK. I am still puzzled between the experience in our State and that of New Mexico. There is a significant difference.

Senator SIMPSON. If you guys would have stayed a nonagreement State, all this would not have happened.

Senator DOMENICI. It would be worse.

Senator SIMPSON. Worse, that is right.

Thank you very much.

We appreciate your testimony.

[Attachments to Mr. Hazle's statement follow:]

ATTACHMENTS TO THE STATEMENT OF ALBERT J. HAZLE

Colorado Uranium Operations

Operational

Conventional

Union Carbide at Uravan

Cotter Corporation at Canon City

Heap Leach

Union Carbide at Maybell

Special

Sweeney Mining & Milling at Boulder

Ore Buying Stations

General Electric at Naturita

Cotter Corporation at Whitewater

Pioneer Uravan at Slick Rock

Authorized Construction

Conventional

Homestake Mining Company at Sargents

Pending Licensing Actions

Union Carbide at Uravan - renewal - conventional

Pioneer Uravan at Slick Rock - conventional

Cyprus Mines at Canon City - conventional

Union Oil of California at Keota - in situ leach

Cotter Corporation at Golden - ore crushing and sorting

Gates and Fox at Vancorum - heap leach

Authorized Operations in Various Stages of Decommissioning

Wyoming Minerals at Grover - in situ leach

Ranchers Exploration at Naturita - heap leach

Inactive Uranium Mill Tailings Piles - UMTRAP

Durango, Grand Junction, Rifle (2), Gunnison

Slick Rock (2), Naturita, and Maybell

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Ref: SA/JRM

JUN 10 1981

Mr. Albert J. Hazle, Director
Radiation and Hazardous Wastes
Control Division
Colorado Department of Health
4210 East 11th Avenue
Denver, Colorado 80220

Dear Mr. Hazle:

We have completed our review of the proposed revisions to the Colorado regulations on uranium milling forwarded with your letter of April 8, 1981. The State has done a commendable job in meeting the requirements of UMTRCA. However, there are a number of points in the proposed revision where we feel changes must be made for the regulations to be equivalent to, or more stringent than NRC regulations.

1. Section 3.9.4.1 - In the first line of this section, the word "may" should be changed to "shall". In order to be compatible with NRC regulations, there must be no ambiguity concerning these requirements.

2. Section 3.9.4.4 - A similar ambivalence exists in this section. This section provides that "... the surety arrangements may cover the payment of the charge for long-term care and monitoring required by Section 3.9.5." Again, the word "may" should be changed to "shall".

3. Section 3.9.5.4.2 - This section should be clarified to make it clear that the fund discussed here shall be provided by each mill operator to the state, e.g., to the general state treasury. In addition, we suggest that the phrase "monitoring and maintenance of the site" be replaced by "site control," to avoid the implication that long term active maintenance is an acceptable alternative.

4. Section 3.9.5.4.3 - This section requires that upon termination of a source material license, provisions shall be made for transfer of appropriate funds to the Federal Government. This formulation leaves open the question of who is to make such provision and what are appropriate funds. The regulations should be clarified to answer these questions.

5. Section 3.10.6.4.2 - This section should be amended to require that the daily inspection addressed here be performed by a qualified engineer or scientist. This provision was inadvertently left out cf the proposed SSR wording.

6. Part III, Schedule E, Criterion 4 - There appears to be some wording missing here. Criterion 4 has no paragraph (d). What appears to be paragraph (c)(1) should actually be (d)(1) and an introductory paragraph to (d) should be added to read as follows:

   "(d) A full self-sustaining vegetative cover shall be established or rock cover employed to reduce wind and water erosion to negligible levels."

   Subparagraph (d)(1) would then continue:

   "(1) Where a full vegetative cover..."

7. Part III, Schedule E, Criterion 4 - There also appears to be a sentence missing from subparagraph (3) of what should be paragraph (d). After the sentence which reads "Individual rock fragments shall be... by water and frost action.", the following sentence should be added: "Weak, friable, or laminated aggregate shall not be used."

8. Part III, Schedule E, Criterion 8 - In accordance with Section 83.(b)(1)(B)(4) of the Atomic Energy Act, paragraph (b) of Criterion 8 should be amended to make it clear that any waiver of the surface land ownership transfer requirements must be approved by the NRC.

Please let us know if you agree with the incorporation of these changes.

Sincerely,

G Wayne Kerr

G. Wayne Kerr, Director
Office of State Programs

The Colorado
MINING ASSOCIATION

DAVID R COLE
Secretary and Manager

1981
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June 5, 1981

Radiation and Hazardous Wastes Control Division
Colorado Department of Health
4210 E. 11th Avenue
Denver, Colorado 80220

Attention: Frank A. Traylor, M.D.
Executive Secretary, Colorado Board of Health

Re: Comments on Proposed Revisions to Colorado Radiation Control Regulations and Related Documents

The attached comments are submitted on behalf of the Colorado Mining Association and the members of that Association which are or which contemplate engaging in uranium milling in the state of Colorado. These comments address the proposed revisions to the Colorado Radiation Control Regulations which are before the Board for action at the hearing scheduled for June 17, 1981.

The present revisions have been proposed by the Radiation and Hazardous Wastes Control Division of the Department of Health and were previously submitted to the Board. The proposals have been made available to the Colorado Mining Association and the members of that Association engaged in or contemplating uranium milling. The proposals have been carefully analyzed, and the comments represent the combined effort and careful consideration by technical, administrative and legal representatives of all the concerned companies.

We are very aware of the mandate placed upon the Department of Health by the provisions of Public Law 95-604 and the guidance and directives furnished to agreement states by NRC in connection with that statute. We are also aware of the intensive work done by the Division of Radiation and Hazardous Wastes Control in preparing these proposals under the strictures of the federal action. We are appreciative of the efforts

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made by the Division to reconcile the state program with the federal requirements. It should be noted, however, that many of the substantive provisions included in the proposed revisions are currently being challenged by CMA members in the federal courts (see, e.g. Kerr-McGee Nuclear, et al. v. N.R.C., C.A. No. 80-2043, USCA-10). Although CMA members favor continuation of Colorado's agreement state status, we cannot take a position with respect to the state regulations which is inconsistent with our position regarding similar NRC requirements. Accordingly, we intend to pursue all available administrative and judicial remedies in challenging regulations which we believe to be illegal or inappropriate.

Our comments will follow the following format:

I. Comments on the proposed rationale for the regulations.

II. Comments on the proposed fiscal impact statement.

III. Comments on the proposed revisions to the regulations.

IV. Comments on proposed Part III, Schedule E, of the regulations.

Thank you for the opportunity to present our comments.

Sincerely,

David R. Cole
David R. Cole

DRC/z

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I. COMMENTS ON PROPOSED RATIONALE.

The draft rationale inaccurately reflects the standard for agreement state conformity with the program of the United States Nuclear Regulatory Commission subsequent to the enactment of the Uranium Mill Tailings Radiation Control Act of 1978 (Public Law 95-604).

Prior to the enactment of Public Law 95-604, the Atomic Energy Act of 1954 required that the programs of agreement states be "compatible" with that of NRC, in order that agreement state status be maintained. Public Law 95-604 is a statute which is aimed directly and specifically at management, control and disposition of uranium mill tailings. In the amendment, the standard for agreement state conformity with the NRC program is stated in terms of "equivalency". The equivalency test, however, is applicable only to "byproduct material" which is redefined by Public Law 95-604 to include uranium mill tailings. For aspects of agreement state programs other than those relating to byproduct material as redefined, the standard for conformity remains that contained in the Atomic Energy Act of 1954, to-wit: compatibility.

II. COMMENTS ON PROPOSED FISCAL IMPACT STATEMENT.

The Colorado Administrative Procedure Act, §24-4-101, et seq. C.R.S. (1973) obligates state agencies to evaluate the economic impacts of their rule-making activities. See, e.g. §24-4-101.5, C.R.S. (1973). Pursuant to this requirement, all rules proposed by the Department and adopted by the Board must be accompanied by a fiscal impact statement identifying the persons or groups who will bear the cost of the rule.

Pursuant to the foregoing requirements of the APA, the Division has appended a fiscal impact statement to the proposed regulations. Simply stated, the Division is taking the position that the proposed regulatory changes will have virtually no fiscal impact, with the exception of certain license fee increases.

Contrary to the Division's estimates, the cost increases to licensees resulting from the revised regulations will be dramatic, to say the least. Licensees will be forced to bear increased costs in the following areas:

1. License fees
2. Sureties
3. Reclamation, Decommissioning & Long-term Care

4. Administrative & Legal

5. Consulting fees

In the case of operations currently conducted by two licensees operating mills in Colorado (Union Carbide Corporation and Cotter Corporation), the revised regulations will result in cost increases in excess of $50 Million. Such cost increases will occur in the following areas:

	Present Regulations	New Regulations	Difference
1. LICENSE FEES	$295,500	$452,500	+$160,500
2. SURETIES	$230,000	$2,115,000	+$1,885,000
3. RECLAMATION, DECOMMISSIONING & LONG TERM CARE	$5,875,000	$56,850,000	+$50,975,000
4. ADMINISTRATIVE/ LEGAL	$312,250	$1,043,000	+$730,750
5. CONSULTING FEES (cover design & placement, ground water monitoring, air emission controls, and preparation of expanded ER)	$950,000	$2,450,000	+$1,700,000
TOTAL:	$7,462,750	$62,910,000	+$55,447,250

III. COMMENTS ON PROPOSED REVISIONS TO THE REGULATIONS.

Our comments on the proposed revisions to the regulations are in the following format:

A. Recitation of the particular rule or portion thereof being addressed;

B. CMA's proposed revisions to the rule, or, where appropriate, proposed additions where no rule has previously existed; and

C. Comments on the proposed revisions or additions.

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RH 3.9.4.1

An applicant may be required to furnish financial surety arrangements to insure the protection of the public health and safety in the event of abandonment, default, or inability of the licensee to meet the requirements of the Act, these regulations, and the license including decontamination and decommissioning of the facility.

PROPOSED REVISIONS:

An applicant may be required to furnish financial surety arrangements to insure the protection of the public health and safety in the event of abandonment, default, or inability of the licensee to comply with decontamination, decommissioning, and reclamation requirements imposed as a condition of licensure.

COMMENT:

As presently worded, proposed RH §3.9.4.1 would allow CDH to draw against a licensee's financial surety arrangement (bond, letter of credit, or certificate of deposit) based on any alleged violation of the license, or of the Radiation Control Act and CDH regulations. RH 3.9.4.1 will thus function as a prepaid civil penalty provision, enabling CDH to draw against the surety whenever it determines that a license violation has occurred. Proposed RH §3.9.4.1 goes far beyond the enforcement powers delegated to CDH by the Colorado Radiation Control Act, which does not give CDH the power to impose civil penalties for license violations. It is a well established rule in Colorado that a regulation issued by an administrative body, in order to be valid, must be within the scope of the statutory delegation of authority which underlies the regulation. *See, e.g.*, *Dixon v. Zick*, 179 Colo. 278, 500 P.2d 130 (1972). Proposed RH §3.9.4.1 is clearly inconsistent with its underlying statutory authority, and thus is unlawful. It should be noted that an attempt to amend the Radiation Control Act to grant CDH the power to impose civil penalties (H.B. 1263) was defeated in the General Assembly during the present session. The Department cannot gain powers by rulemaking which the General Assembly has refused to delegate by statute.

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RH § 3.9.4.2

The financial surety arrangement required by 3.9.4.1 shall be furnished to and in a form approved by the Department prior to the issuance of a license, or any amendment or renewal of an existing license, as required by the Department. The applicant shall furnish such evidence of initial and continued financial surety responsibility sufficient to maintain the financial surety in force, as required by the Department. The amount of funds to be insured by such surety arrangements shall be based on Department approved cost estimates. Self-insurance, or any arrangement which essentially constitutes self-insurance will not satisfy the surety requirement.

PROPOSED REVISIONS:

Change the last sentence to read as follows: Self-insurance, or any arrangement which essentially constitutes self-insurance, will not satisfy the surety requirement, provided, that self-insurance shall be authorized for the long-term care requirements of §3.9.5, and provided further, that certain types of self-insurance, such as collateral bonding may be acceptable, where the licensee's assets are of sufficient size to warrant this type of surety.

COMMENT:

Self-insurance may be appropriate particularly for long-term care requirements. During the period of active operations, long-term care requirements are not necessary. This is recognized by the NRC rules and guidelines as well as the final GEIS. Although this section purportedly applies only to the "performance surety" requirements, clarification should be added to allow self-insurance for long-term care requirements during operations and before decommissioning. Self-insurance is also a viable means of providing surety in cases where the licensee is a major corporate entity with extensive financial assets. There is no reason to prevent large corporate licensees from using their own assets as collateral to secure performance of reclamation or long-term care requirements.

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RH 3.9.4.2.5

Such other evidence of initial and continued financial responsibility as may be required by the Department, including financial surety previously provided to any state or federal agency concerning activity subject to license under these regulations, or the amount, terms and conditions of such surety have been established to the satisfaction of the Department, provided such arrangements are considered adequate to satisfy these requirements and that portion of the surety which covers the decommissioning and reclamation of the facility and associated areas, and the long-term monitoring and maintenance are clearly identified.

PROPOSED REVISION:

Add a new RH 3.9.4.2.5 which would read as follows: A contractual lien on all buildings and structures on the affected lands. Such lien shall be accompanied by information on the estimated costs of removal of the buildings and structures, and information on the salvage value of the materials and components.

Re-number existing RH 3.9.4.2.5 to RH 3.9.4.2.6.

COMMENT:

This revision will add another element of flexibility for providing acceptable surety which will be less costly to the operator while ensuring the availability of funds to the state.

RH § 3.9.4.5

The licensee's surety mechanism will be reviewed annually by the Department and be adjusted to recognize any increases or decreases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. An appropriate portion of surety liability shall be retained until final compliance with the reclamation plan is determined.

PROPOSED REVISION:

The licensee's surety mechanism will be reviewed annually by the Department and be adjusted to recognize any increases or decreases resulting

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from inflation, changes in engineering plans, reclamation and other activities performed, and any other conditions affecting costs. An appropriate portion of surety liability shall be retained until final compliance with the reclamation plan is determined.

COMMENT:

The addition of "reclamation and other" activities specifies one added major item affecting surety costs.

RH § 3.9.5.4.1

The final disposition of tailings or wastes should be such that the need for ongoing active maintenance, as defined in the final generic environmental impact statement on uranium milling, is not necessary to preserve isolation. As a minimum, annual site inspections shall be conducted by the government agency retaining ultimate custody of the site where tailings, or wastes are stored to confirm the integrity of the stabilized tailings, or waste systems and to determine the need, if any, for maintenance and/or monitoring. Results of the inspection shall be reported to the U.S. Nuclear Regulatory Commission within 60 days following each inspection. The U.S. Nuclear Regulatory Commission may require more frequent site inspections if, on the basis of a site-specific evaluation, such a need appears necessary due to the features of a particular tailings or waste disposal system.

PROVIDED REVISION:

The final disposition of tailings or wastes should be such that the need for ongoing active maintenance is, to the maximum extent practicable, eliminated. As a minimum, annual site inspections shall be conducted by the government agency retaining ultimate custody of the site where tailings, or wastes are stored to confirm the integrity of the stabilized tailings, or waste systems and to determine the need, if any, for maintenance and/or monitoring. Results of the inspection shall be reported to the U.S. Nuclear Regulatory Commission within 60 days following each inspection.

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COMMENT:

This amendment is proposed in order that the responsibility of the regulator and the obligation of the licensee comport with reality. Just as there is no such thing as "zero discharge" from an impoundment, there is no method of disposal which absolutely assures that no need for maintenance might occur hundreds of years in the future. To create a requirement contrary to that reality may well give rise to false expectations and to findings required by the license issuer which cannot in honesty be made, and which, if made, produce protracted litigation seeking to overturn the licensing action.

The language proposed for deletion is a statement of the regulatory program of USNRC. It has no applicability to the operations or requirements of the State of Colorado, and no relevance to the performance of a licensee in an agreement state. The statement is enlightening but irrelevant to a regulation dealing with the licensing and operation of uranium mills in Colorado.

RH § 3.9.5.4.2

A fund shall be established based on Department approved cost estimates, and for source material milling operations shall not be less than $250,000 (1978 dollars). The funds provided by the licensee shall yield interest in an amount sufficient to cover the average annual cost of monitoring and maintenance of the site based on an assumed 1% annual real interest rate. An annual review of the inflation rate and interest yield will be accomplished by the Department and necessary changes made in the long-term care agreement with the licensee. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

PROPOSED REVISIONS:

A fund shall be established based on Department approved cost estimates, after consultation with the licensee. The fund shall not in any event be less than $250,000. The funds provided by the licensee shall yield interest in an amount sufficient to cover the average annual cost of monitoring and maintenance of the site based on an assumed 2% annual real interest rate. An annual review of the inflation rate and interest yield will be accomplished by the Department and necessary changes made in consultation with the licensee in the long-term care agreement with the licensee.

COMMENT:

This provision has been changed to prevent automatic and unilateral amendment of the license by the state. Reference to an automatic index for inflation adjustment eliminates requisite flexibility for the operator as well as the state. In any given year, the Consumer Price Index (CPI) may bear little or no relation to the actual inflation rates prevalent in the mining and milling industries. These adjustments must be allowed to remain the subject of yearly negotiations between operators and the state. An automatic adjuster, particularly the CPI, is totally arbitrary and inflexible. Commentors further request that a 2% annual real interest rate be used rather than the proposed 1% rate. The basis for this request is that a 2% annual real interest rate is a more accurate reflection of the historic earning power of investments. Research performed by Union Carbide Corporation's corporate finance group has shown that the average domestic corporate bond yield over the last 30-year period (1950-1980) exceeds the GNP deflator by 2%. Supporting data on the research performed by Union Carbide Corporation's corporate finance group will be supplied as an appendix to these comments at the hearing on June 17, 1981.

RH § 3.9.9.2.1.3

The matters of fact and law asserted or to be considered.

PROPOSED REVISION:

The matters of fact and law asserted or to be considered, to the extent then known.

COMMENT:

This amendment is proposed in order to eliminate the interposition of highly technical appeals based upon assertions of inadequate notice. License notice and hearing process established in the regulation contemplates and even encourages the formulation and refinement of issues even after notice has issued. This process could easily be thwarted and perverted if the notice provision is lacking in flexibility. One of the most common grounds of administrative appeal is based upon claims of inadequate notice resulting in deprivation of due process.

RH § 3.9.9.3.2

Application for party status must identify the individual or group applying, state an address or phone number where they may be contacted, state the nature of their interest in the hearing, and the specific ground on which they claim to be affected or aggrieved, and state the specific aspects of the hearing to which they wish to address.

PROPOSED REVISION:

Application for party status must identify the individual or group applying, and its address and telephone number. The application shall be signed by the party or his authorized representative, or by an attorney having authority with respect to it. The capacity of the person signing, his address, and the date shall be stated. The signature of a person signing in a representative capacity is a representation that the document has been subscribed in the capacity specified with full authority, that he has read it and knows the comments, that to the best of his knowledge, information, and belief the statements made in it are true, and that it is not interposed for delay. If a document is not signed, or is signed with intent to defeat the purpose of this section, it may be stricken. The application document must include the following elements:

1. The nature and extent of the applicant's property, financial, or other interest in the proceeding, and the specific ground on which the applicant claims to be affected or aggrieved;

2. The possible effect of any order which may be entered in the proceeding on the applicant's interest;

3. The specific aspects of the hearing which the applicant intends to address. If the applicant objects to certain conditions in a proposed license, the proposed alternative

condition(s) must be included in the application;

4. The general nature of the testimony and/or evidence which the applicant intends to present at the hearing.

COMMENT:

See comments on RH § 3.9.9.3.3 infra.

RH § 3.9.9.3.3

The Department, or the hearing officer, will grant or deny party status based on the nature and extent of the person's property, financial or other interest in the hearing and the possible effect of any order which may be entered as a result of the hearing on the person's interest. Any person applying for a granted party status may, by motion to the hearing officer or Department, as appropriate, challenge the right of any other person to be a party.

PROPOSED REVISION:

The Department, or the hearing officer, will grant or deny party status based on consideration of the following factors:

1. The nature and extent of the applicant's property, financial, or other interest in the hearing;

2. The possible effect of any order which may be entered in the proceeding on the applicant's interest;

3. The extent to which the applicant's interest will be represented by existing parties;

4. The extent to which the applicant's participation may reasonably be expected to assist in developing a sound record;

5. The availability of other means whereby the applicant's interest will be protected; and

6. The extent to which the applicant's participation will broaden the issues or delay the proceedings.

COMMENT:

The proposed changes in §§ 3.9.9.3.2 and 3.9.9.3.3 concerning elements of the application for party status, and the criteria for granting party status, are taken from the NRC's procedural rules (10 C.F.R. 2.708-2.714), and the Rules of Procedure Before the Colorado Water Quality Control Commission, both of which govern requests for party status and intervention in administrative hearings. While commentors have no objection to the provisions of the proposed rule, we believe that the procedural and substantive criteria for party status should be more fully developed to insure against frivolous applications by persons who generally are opposed to nuclear power as a fuel source and would seek to appeal or intervene in licensing proceedings on that basis.

RH § 3.9.9.3.4

Parties and persons who have applied to become parties shall have the right to initiate discovery. Parties shall have the right to make motions or objections, present evidence, cross-examine witnesses, and appeal from the decision of the hearing as provided by the Colorado Administrative Procedure Act, 24-4-101 et seq. C.R.S. 1973 as amended.

PROPOSED REVISION:

Parties shall have the right to initiate discovery. Parties shall have the right to make motions or objections, present evidence, cross-examine witnesses, and appeal from the decision of the hearing as provided by the Colorado Administrative Procedure Act, 24-4-101 et seq. C.R.S. 1973 as amended.

COMMENT:

The provision that persons who are not and may never become parties may exercise the right of discovery, one of the most significant rights of a party, is an invitation to misrule and abuse. The Department defends the proposal on the grounds that the rights of those who may become parties to participate fully must be preserved. This concern can be addressed adequately by amendments to the party provisions (3.9.9.3.1) shortening the 20-day period for application for party status, and prescribing action upon such application by the hearing officer within a short period, perhaps five days, thereafter (3.9.9.3.3).

RH § 3.9.9.4.2.1

A brief summary of the nature of the claim of the party and the basis therefor:

PROPOSED REVISIONS:

A brief summary of the contentions and evidence to be offered in the case in chief of the party and the basis therefor:

COMMENT:

These are editorial comments which are self-explanatory.

RH § 3.9.9.5.1

Any party or person who has applied to become a party may initiate discovery in the form of interrogatories to another party, requests for admission to another party, requests for production of documents to another party, or depositions of any persons: or any combination thereof. The Colorado Rules of Civil Procedure, to the extent not inconsistent with the State Administrative Procedure Act shall apply. Such discovery may be modified by a motion for protective order filed with the department or hearing officer within seven (7) days of receipt of the notice of request for discovery. Motions for protective order shall set forth the grounds in support thereof and shall be ruled upon immediately. Discovery shall be completed no later than ten (10) days preceding the hearing date, except as otherwise ordered by the department or hearing officer.

PROPOSED REVISION:

Any party may initiate discovery in the form of interrogatories to another party, requests for admission to another party, requests for production of documents to another party, or depositions of any persons: or any combination thereof. The Colorado Rules of Civil Procedure, to the extent not inconsistent with the State Administrative Procedure Act shall apply. Such discovery may be modified by a motion for protective order filed with the department or hearing officer within seven (7) days of receipt of the notice of request for discovery. Motions for protective order shall set forth the grounds in support thereof and shall be ruled upon immediately. Discovery shall be completed no later than ten (10) days preceding the hearing date, except as otherwise ordered by the department or hearing officer.

COMMENT:

The comment to this proposed change is the same as that made in connection with section 3.9.9.3.4.

RH § 3.9.10.1.3

Consideration of alternatives to the activities to be conducted, including alternative sites and engineering methods;

PROPOSED REVISION:

Consideration of alternatives to the activities to be conducted including alternative sites and engineering methods, but excluding consideration of generic as opposed to project specific issues relating to energy choices, economics and the like;

COMMENT:

The purpose of the suggested limitation is to avoid involving the Department in generic considerations which represent societal, political or economic judgments beyond the statutory duty and expertise of the Department.

RH § 3.10.6.1.6

Site and project alternatives.

PROPOSED REVISION:

Site and Project alternatives excluding, however, alternative modes of energy production or other alternative considerations involving societal, political or generic economic judgments.

COMMENT:

The comment made in connection with the modification proposed to 3.9.10.1.3 is applicable here.

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RH § 3.17

Amendment of licenses at request of licensee. Applications for amendment of a license shall be filed in accordance with RH § 3.8 and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment. (No revisions proposed by CDH).

PROPOSED REVISIONS:

Amendment of licenses at request of licensee. Applications for amendment of a license shall be filed in accordance with RH § 3.8 and shall specify the respects in which the licensee desires his license to be amended and the grounds for such amendment. For purposes of this section, the term "license amendment" shall be defined as a process change which results or has the potential to result in a net increase in routine operational releases of radioactive particulates and/or radon gas from the licensed facility.

COMMENT:

No change in this regulation has been included in the proposed revisions. Commentors believe that the present RH 3.17 is deficient, and the proposed revisions should include a change in this section. This section is deficient in that it contains no definition of the term "amendment". Thus, it could be argued that any process modification in a facility--no matter how insignificant the change--will force a licensee to comply with the application and environmental report requirements of RH § 3.8. Commentors urge that RH § 3.17 be revised to include a definition of the term "amendment", and that this concept be limited to process changes of sufficient significance to warrant the expense and delay incidental to the processing of an application under RH § 3.8.

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IV. COMMENTS ON PROPOSED PART III, SCHEDULE E, OF THE REGULATIONS.

These comments will follow a slightly different format. Proposed deletions from the proposed rule are slashed, and proposed additions are underlined.

CRITERION 1

(a) In selecting among alternative tailings disposal sites ~~or judging the adequacy of existing tailings sites~~, the following site features which would assure meeting the broad objective of ~~isolating the tailings and associated contaminants from man and the environment in the short term and for thousands of years without ongoing active maintenance~~ reducing harmful emissions from the tailings during operations and over the long-term without ongoing regular maintenance shall be considered:

- (1) Remoteness from populated areas:
- (2) Hydrogeologic and other environmental conditions conducive to continued immobilization and isolation of contaminants from usable groundwater sources: and
- (3) Potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term.

(b) The site selection process shall be an optimization to the maximum extent reasonably achievable in terms of these features.

(c) In the selection of disposal sites, primary emphasis shall be given to isolation of tailings or wastes, a matter having long-term impacts, as opposed to consideration only of short-term convenience or benefits, such as minimization of transportation or land acquisition costs. While isolation of tailings will be a function of both site characteristics and engineering design, overriding consideration shall be given to siting features given the long-term nature of the tailings hazards.

(d) Tailings shall be disposed of in a manner such that no active maintenance is required to preserve the condition of the site.

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COMMENT:

The first deletion is suggested as application of this criterion retroactively to existing sites is not appropriate or lawful. This criterion could not have been anticipated or planned for at existing sites and could easily destroy the economic viability of existing projects, especially considering the present economic state of the uranium industry. How would it be possible to make any selection when the site is already in use?

The second deletion and addition are made as this more concisely states the reasonable broad objective of tailings stabilization. A regulation that calls for actions to be effective for thousands of years is unrealistic. In its proposed disposal standards for inactive uranium processing sites (46 F.R. 2556, January 9, 1981), EPA has recognized the impracticality of the imposition of remedial action standards for periods in excess of one thousand years (see EPA's comments on proposed rules, 46 F.R. at 2560) particuarly where, as here, site-specific evaluation of the need for a longer period is not present. In comments on remedial action for uranium processing sites (40 CFR 192) prepared by Robley D. Evans at the invitation of Dr. William A. Mills (Director, Criteria and Standards Division, Office of Radiation Programs, U.S. EPA) Evans points out that "even 100 to 200 years seems more than an adequate time span".

Evans also states that, "Disposal" without any form of occasional surveilance is impracticable. "Management", not "disposal", is a more realistic plan". Mr. Evans said in a telephone call that "surveilance" included inspection and maintenance.

It should be noted that uranium mill tailings constitute only a potential hazard. While they contain some toxic materials, they are not hazardous unless the toxic components reach human subjects.

CRITERION 2

To avoid proliferation of small waste disposal sites, radioactive material from ~~in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from~~ small remote above ground extraction operations shall preferably be disposed of at existing large mill tailings disposal sites: unless, considering the nature of the wastes, such as their volume

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and specific activity and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantage of onsite burial ~~clearly~~ outweigh the benefits of reducing the perpetual surveillance obligations.

COMMENT:

The criterion is clear enough without these excess words. When attempting to apply this criterion to a specific site, several facts must be considered. Operators of in-situ and small remote above-ground extraction operations may not also operate existing large mills. Therefore, before their wastes could be disposed of at the tailings disposal sites of large mills, the operators of the mills would have to be persuaded to accept them. Questions of proportionate costs and liability would have to be considered. Existing mills may have planned for only enough tailings capacity for the tailings from their mills. Also, the wastes from the small sites may not be compatible and could lead to instability of the tailings impoundments.

CRITERION 3

~~The "Prime Option" for disposal of tailings is placement below grade, either in mines or specially excavated pits.~~

In order to meet the objective of reducing harmful emissions from tailing areas during operations and over the long-term, the evaluation of alternative sites and disposal methods performed by mill operators in support of their proposed tailings disposal program shall reflect serious consideration of ~~the disposal mode~~ full or partial placement below grade, as appropriate. In some instances below-grade disposal may not be the most environmentally sound approach, such as might be the case if a high quality groundwater formation is relatively close to the surface or not very well isolated by overlying soils and rock. Also, geologic and topographic conditions might make full, below-grade burial impracticable: for example, bedrock may be sufficiently near the surface that blasting would be required to excavate a disposal pit at excessive cost, and more suitable alternate sites are not available. ~~Where full below grade burial is not practicable, the size of retention structures, and size and steepness of slopes of associated exposed embankments,~~

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~~shall be minimized by excavation to the maximum extent reasonably achievable or appropriate given the geologic and hydrogeologic conditions at a site. In these cases, it must be demonstrated that an above-grade disposal program will provide reasonably equivalent isolation of the tailings from natural erosional forces.~~

COMMENT:

We have stated the health goal to be achieved in the first addition and have removed reference to a "prime option". Establishing a "prime option" is not appropriate since it creates a presumption in favor of one technique for tailings disposal. The criterion should only require disposal adequate to meet the health goal, through the use of whatever method is most suitable for each specific site. The mill license applicant should not be required to compare and contrast other techniques that are not suitable to the specific mill site.

We have deleted the last portion of the proposed criterion as the department has created a "Catch 22" which should be removed. In cases where below grade disposal is impracticable, the alternative method must provide "reasonably equivalent isolation of the tailings". However, if below grade disposal is impracticable, it literally cannot be accomplished and therefore, there is no way of determining if the alternative disposal method provides "reasonably equivalent isolation of the tailings".

CRITERION 4

The following site and design criteria shall be adhered to whether tailings or wastes are disposed of above or below grade:

(a) Upstream rainfall catchment areas must be minimized to decrease erosion potential and the size of the maximum possible flood.

(b) Topographic features shall provide good wind protection.

(c) Embankment and cover slopes shall be relatively flat after final stabilization to minimize erosion potential and provide conservative factors of safety assuring long-term stability. The broad objective should be to contour final slopes to

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grades which are as close as possible to these which would be provided if tailings were disposed of below grade: this could, for example, lead to slopes of about 10 horizontal to 1 vertical (10h:1v) or less steep. In general, slopes should not be steeper than about ~~5H/1V~~ 2.5h:1v. Where steeper slopes are proposed, reasons why a slope less steep would be impracticable should be provided, and compensating factors and conditions which make such slopes acceptable should be identified.

(1) Where a full vegetative cover is not likely to be self-sustaining due to climatic conditions, such as in semi-arid and arid regions, rock cover shall be employed on slopes of the impoundment system. The Department will consider relaxing this requirement for extremely gentle slopes such as those which may exist on the top of the pile.

(2) The following factors shall be considered in establishing the final rock cover design to avoid displacement of rock particles by human and animal traffic or by natural processes, and to preclude undercutting and piping:

- (a) Shape, size, composition, gradation of rock particles, excepting bedding material, average particle size shall be at least cobble size or greater:
- (b) Rock cover thickness and zoning of particles by size: and
- (c) Steepness of underlying slopes.

(3) ~~Individual rock fragments shall be dense, sound, and resistant to abrasion, and shall be free from cracks, seams, and other defects that would tend to unduly increase their destruction by water and frost actions. Shale, rock laminated with shale, and cherts shall not be used.~~ Site specific erosion standards shall be established for each license which will allow the use of native rock fragments in a manner and amount to the end that erosion will be minimized.

(4) Rock covering of slopes may not be required where top covers are very thick, on the order of 10 meters or greater: impoundment slopes are very gentle on the order of 10h:1v or less: bulk cover materials have inherently favorable erosion resistance characteristics: and there is negligible drainage catchment area upstream of the pile, and there is good wind protection as described in points (a) and (b) of the criterion.

(5) Furthermore, all impoundment surfaces shall be contoured to avoid areas of concentrated surface runoff or abrupt or sharp changes in slope gradient. In addition to rock cover on slopes, areas toward which surface runoff might be directed shall be well protected with substantial rock cover or rip rap. In addition to providing for stability of the impoundment systems itself, overall stability, erosion potential, and geomorphology of surrounding terrain shall be evaluated to assure that there are no ongoing or potential processes, such as gully erosion, which would lead to impoundment instability.

(e) The impoundment shall not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand. As used in this criterion, the term "capable fault" has the same meaning as defined in section III(g) of Appendix A of 10 CFR Part 100. The term "maximum credible earthquake" means that earthquake which would cause the maximum vibratory ground motion based upon an evaluation of earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material.

(f) The impoundment, where feasible, should be designed to incorporate features which will promote deposition. For example, design features which promote deposition of sediment suspended in any runoff which flows into the impoundment area might be utilized; the object of such a design

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feature would be to enhance the thickness of cover over time.

COMMENT:

A. Criterion 4 specifies several "site and design criteria" which "shall be adhered to whether tailings or wastes are disposed of above or below grade." The various criteria are contradictory in part. For example, one criterion requires that "upstream rainfall catchment areas must be minimized," while another provides that "topographic features should provide good wind protection." The best, and perhaps only, way to minimize upstream catchment areas is to place tailings on mesas or other elevated sites. Such sites, of course, do not provide good wind protection. This contradiction should be resolved by assigning relative weights or preferences to the two factors, given the site specific features of the applicant's proposed mill site and proposed alternatives thereto.

B. The requirement of Criterion 4 that slopes be no steeper than 5h:1v is unreasonable and unsupported. Depending upon the nature of the layers of cover and natural surrounding topographic features, slopes of 2½h:1v will provide adequate protection against erosion. Additionally, the establishment of a vegetative cover will significantly reduce erosion potential.

C. The specifications for "individual rock fragments" to be used in the rock cover required by Criterion 4 are unreasonable and unrealistic. For example, the criterion forbids the use of "weak, friable, or laminated aggregate" or "shale, rock laminated with shale, and cherts". In many areas surrounding existing mills, the only native rock cover reasonably available is "friable" (e.g., sandstone) "laminated aggregate," or "shale (or) rock laminated with shale." These specifications should be deleted and an erosion performance standard substituted for them which will simply allow licensees to use native rock fragments in whatever manner and amounts they find necessary to meet that standard.

CRITERION 7

(a) ~~Milling operations shall be conducted so~~ Mill operators should make every reasonable effort to assure that all airborne effluent releases are reduced to as low as is reasonably achievable. The primary means of accomplishing this shall be by means of emission controls. Institutional

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controls, such as extending the site boundary and exclusion area, may be employed to ensure that offsite exposure limits are met but only after all practicable measures have been taken to control emissions at the source. ~~Notwithstanding the existence of individual dose standards, strict control of emissions is necessary to assure that population exposures are reduced to the maximum extent reasonably achievable and to avoid site contamination. The greatest potential source of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations.~~ Checks shall be made and ~~logged hourly~~ recorded periodically of all parameters, that is differential pressure and scrubber water flow rate, which determine the efficiency of yellowcake stack emission control equipment operations. It shall be determined whether or not conditions are within a range prescribed to ensure that the equipment is operating consistently near peak efficiency; corrective action shall be taken when performance is outside of prescribed ranges. In lieu of ~~hourly checks~~ periodic recordation, the use of monitoring devices with alarms will be considered if the devices monitor all appropriate parameters and are calibrated and checked on a schedule approved by the department. Effluent control devices shall be operative at all times during drying and packaging operations and whenever air is exhausting from the yellowcake stack.

(b) Drying and packaging operations shall terminate when controls are inoperative. When checks indicate the equipment is not operating within the range prescribed for peak efficiency, actions shall be taken to restore parameters to the prescribed range. When this cannot be done without shutdown and repairs, drying and packaging operations shall cease as soon as practicable.

(c) Operations may not be re-started after cessation due to off-normal performance until needed corrective actions have been identified and implemented, unless a restart is necessary to identify the needed corrective actions. All such cessations, corrective actions, and re-starts shall be ~~reported to the department in writing, within 10 days of the subsequent start~~ documented for review by department personnel during routine inspections.

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(d) To control dusting from tailings, that portion not covered by standing liquids shall be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. Consideration shall be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments since this will help in controlling particulate and radon emissions during operation. To control dustings from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.

COMMENT:

The sentences on dose standards, population doses and potential sources of exposure proposed by the Department of Health are simply editorial comment and add nothing substantive to the criterion.

Hourly logging of scrubber parameters is unreasonable and unnecessary. The recovery of yellowcake from the scrubbing system provides a significant incentive for mill operators to maintain scrubbers at peak efficiency. More importantly, though, diversion of mill personnel's attention from operations to "logging" may result in greater risk to public health.

The yellowcake drying and packaging operations could quite possibly be shut down when control equipment is malfunctioning before the cause and corrective actions are identified. It then might be necessary to restart the operations in order to identify them. We have added this option.

The increased paperwork of the 10-day written notification is not justified. Plant personnel should be allowed to concentrate on correcting or preventing problems.

CRITERION 8

These criteria relating to ownership of tailings and their disposal sites become effective on November 8, 1981, and apply to all licenses terminated, issued, or renewed after that date.

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(a) Any uranium or thorium milling license or tailings license shall contain such terms and conditions as the U.S. Nuclear Regulatory Commission and Department determine are necessary to assure that prior to termination of the license, the licensee will comply with ownership requirements of this criterion for sites used for tailings disposal.

(b) Title to the byproduct material license pursuant to 3.10.6 and land, including any interest therein (other than land owned by the United States or by a State) which is used for the disposal of any such byproduct material, ~~or is essential to ensure the long term stability of such disposal site~~, shall be transferred to the United States or the state in which such land is located, at the option of the state. In view of the fact that physical isolation must be the primary means of long term control, and government land ownership is a desirable supplementary measure, ownership of certain severable subsurface interests, for example, mineral rights, may be determined to be unnecessary to protect the public health and safety and the environment. ~~In any case, however, the applicant operator must demonstrate a serious effort to obtain such subsurface rights, and must, in the event that certain rights cannot be obtained, provide notification in local public land records of the fact that the land is being used for the disposal of radioactive material and is subject to either a U.S. Nuclear Regulatory Commission general or specific license prohibiting the disruption and disturbance of the tailings~~. In some rare cases, such as may occur with deep burial where no ongoing site surveillance will be required, surface land ownership transfer requirements ~~may~~ shall be waived. For licenses issued before November 8, 1981, the department ~~may~~ shall take into account the status of the ownership of such land, and interest therein and the ability of a licensee to transfer title and custody thereof to the United States or the state. Subsequent renewals shall not disqualify licensees otherwise eligible for such consideration under this criterion.

(c) The state may permit use of the surface or subsurface land transferred to it if the

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U.S. Nuclear Regulatory subsequent to title transfer determines that use of the surface or subsurface estates, or both, of the land transferred to the United States or the state will not endanger the public health, safety, welfare, or environment: The U.S. Nuclear Regulatory Commission may permit the use of the surface or subsurface estates, or both, of such land in a manner consistent with the provisions provided in these criteria. If the U.S. Nuclear Regulatory Commission permits such use of such land, it will provide the person who transferred such land with the right of first refusal with respect to such use of such land.

(d) Material and land transferred to the United States or the state in accordance with this criterion shall be transferred without cost to the United States or the state other than administrative and legal costs incurred in carrying out such transfer.

(e) The requirements for transfer of title and custody to land and tailings and waste shall not apply in the case of lands held in trust by the United States for any Indian tribe or lands owned by such Indian tribe subject to a restriction against alienation imposed by the United States. In the case of such lands which are used for the disposal of byproduct material, as defined in RH 1.6, the licensee shall enter into arrangements with the U.S. Nuclear Regulatory Commission as may be appropriate to assure the long term surveillance of such lands by the United States.

COMMENT:

The requirement that the licensee transfer title not only to product material and land which is used for the disposal of such material, but also to land essential to insure the long-term stability of such disposal site, is vague, overbroad and unsupported in the Uranium Mill Tailings Radiation Control Act (UMTRCA).

The requirement that a licensee must demonstrate a serious effort to obtain subsurface rights even if they are not necessary to protect the public health and safety is arbitrary and has no support in UMTRCA.

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Criterion 8(b) & (d) provide that upon decommissioning, title to land used for tailings disposal shall be transferred to the government of the United States or of an Agreement state without cost to that government. This constitutes a taking without just compensation and without due process contrary to the Fifth Amendment (and, if a state is involved, the Fourteenth Amendment) to the United States Constitution. The provision should be altered to provide that just compensation for the property and estate(s) conveyed shall be paid to the decommissioning licensee. At the very least, subdivision (c) should be revised to make clear that if the Commission should determine, after a licensee's decommissioning and conveyance of the site to the government, that any use of any surface or subsurface estate is allowable, a right of first refusal of such use at no cost shall be provided the conveying licensee.

CERTIFICATE OF MAILING

I certify that a copy of "Comments on Proposed Revisions to Colorado Radiation Control Regulations and Related Documents" were mailed June 5, 1981, with postage prepaid to the following Board of Health Members:

Richard N. Bluestein
National Jewish Hospital
Colfax & Colorado Blvd.
Denver, CO 80206

Al Hayden
Pueblo County Courthouse
Tenth and Main
Pueblo, CO 81003

Amilu Martin
2140 East LaSalle Street
Colorado Springs, CO 80909

Gatewood Milligan
3191 South Broadway
Englewood, CO 80110

Charles Mitchell
3455 Gaylord
Denver, CO 80205

Carol Rushold
Lower Valley Hospital
228 North Cherry
Fruita, CO 81521

Robert Sabin
P.O. Box 490
LaJunta, CO 81050

Linda Shaw
2193 South Estes Way
Lakewood, CO 80227

Done this 5th day of June, 1981.

KIRKLAND & ELLIS
By Belva J. Woodend
Belva J. Woodend
1625 Broadway
Denver, Colorado 80202

DOE/COLO UMTRAP Cooperative Agreement
Negotiation Policy

The Colorado Department of Health by state statute is the state agency authorized to implement the inactive uranium mill tailing remedial action program under PL 95-604, Title I. Due to this fact and that the Department has a major role in any uranium recovery operation untaken by a DOE subcontractor under this program, the Department shall have the lead responsibility for the conduct of the Cooperative Agreement Contract negotiation.

The Health Department will therefore coordinate with and inform:

The Department of Law, Natural Resources Section
The Department of Law, Legal Services Section
The Department of Natural Resources, Colorado Geological Survey
The Department of Administration, State Controller's Office
The Department of Administration, Division of Purchasing
The Office of the Governor.

The State position is currently that the State is only required to

Acquire real properties at required by the Act and as identified by DOE.
Pay for 10% of the cost of remedial action (limited to remedial action and the acquisition of real properties.
Concur in the action proposed by DOE

Additionally,

The concurrence of the State is absolute, however it is limited to the extent the State participates (remedial action and acquisition of properties).

The DOE honor state requirements for permits, licenses and certificates of designations, as appropriate.

The State signatory for the Cooperative Agreement shall be the Executive Director of the Colorado Department of Health.

Date Adopted 4/7/81

Frank A. Traylor, M.D.
Executive Director
Colorado Department of Health

State Candidate Site Review Committee

Policy

Under an agreement with the Colorado Department of Health, the Colorado Geological Survey is to identify potential sites for the disposal of tailings and other mill residues as part of the State's effort in UMTRAP. The ultimate purpose of this effort is to reduce the number of viable alternate sites to 3 or 4 locations to be considered by the U.S. Department of Energy in the NEPA process. The basic criteria for the site evaluation shall be the U.S. Nuclear Regulatory Commission's uranium mill tailing disposal criteria. Public lands shall be given full consideration. An attempt shall be made to notify all owners of record prior to public availability of the Preliminary Site Evaluation Report. A final report including recommendations shall be submitted to the Colorado Department of Health for subsequent transmission to the Department of Energy.

To assist the Colorado Geological Survey in the performance of its task, a Candidate Site Review Committee will be appointed by the Colorado Department of Health to address specific locales. Representation on the Candidate Site Review Committee shall include but not be limited to:

- Colorado Department of Highways
- Colorado Department of Natural Resources
  - Colorado Geological Survey (committee chairman)
  - Mined Land Reclamation Division
  - Wildlife Division
  - Water Resources Division
- Colorado Department of Health
  - Epidemiology and Disease Control Division
  - Radiation and Hazardous Wastes Control Division
    - Solid Waste Section
    - Radiation Control Section
  - Water Quality Control Division
- Colorado Department of Local Affairs
- A representative from groups in the involved jurisdiction (county)
- Person recommended by the Governor's Science and Technology Advisory Council

The basic charge to the Candidate Site Review Committee include; a), individual representatives shall bring to the Candidate Site Review Committee additional criteria or guidelines for site unacceptability and other issues and concerns; b), individual representatives have a responsibility to coordinate efforts within their area of expertise or concern, particularly in the locale under evaluation; c), the committee shall review and comment as asked by the chairman, and d), public input will be encouraged during the review process including a public comment period at each meeting of this committee.

All issues, concerns and deliberations shall be summarized, and along with the Committee's recommendations, shall be included in the Colorado Geological Survey's report submitted to the Colorado Department of Health.

Following the finalization of the Colorado Geological Survey Report, the Candidate Site Review Committee is expected to provide comments as an entity, in addition to the comments provided by their respective groups or agencies, during the NEPA process and in the development of the Official State Concurrence on the project.

The Colorado Department of Health and the U.S. Department of Energy are not bound by the recommendations made by the Colorado Geological Survey or the Candidate Site Review Committee.

Date Adopted ____________

Frank A, Traylor, M.D.
Executive Director
Colorado Department of Health

State UMTRAP Concurrence Policy

The Colorado Department of Health by state statute is the state agency authorized to implement the inactive uranium mill tailing remedial action program under PL 95-604, Title I. Due to this fact and that the Department has a major role in any uranium recovery operation untaken by a DOE subcontractor under this program, the Department shall have the lead responsibility for the conduct of the Cooperative Agreement Contract negotiation.

Agencies involved or providing input in the development of the official concurrence are:

State Agencies

- Department of Administration
  - Office of the State Controller
  - Division of Purchasing
- Department of Agriculture
- Department of Health
  - Air Quality Control Division
  - Consumer Protection Division
  - Epidemiology and Chronic Disease Control Division
  - Laboratory Division
  - Radiation and Hazardous Wastes Control Division
  - Water Quality Control Division
- Department of Highways
- Department of Local Affairs
  - Division of Planning
  - Division of Energy and Mineral Impact
- Department of Military Affairs
  - Division of Disaster Emergency Services
- Department of Natural Resources
  - Division of Geological Survey
  - Division of Mines
  - Division of Mined Land Reclamation
  - Division of Water Resources
  - Division of Wildlife
  - Board of Land Commissioners
  - Water Conservation Board
- Department of Regulatory Agencies
  - Office of Energy Conservation
- Colorado Historical Society
- Department of Law
- Offices of the Governor and Lieutenant Governor
  - Citizen's Advocate Office
- State Treasurer
- Air Pollution Control Commission
- Water Quality Control Commission

Local Government Agencies

- Boards of County Commissioners
- County Planning Commissioners
- Regional Councils of Government or their equivalent
- Municipal Officials
- Local Health Departments

Others

Candidate Site Review Committee
Indian Tribal Councils

Federal Agencies

U.S. Nuclear Regulatory Commission
U.S. Environmental Protection Agency
U.S. Corps of Army Engineers
U.S. Department of Agriculture
  Forest Service
U.S. Department of Interior
  Bureau of Land Management
  Bureau of Indian Affairs
U.S. Department of Labor
  Mine Safety and Health Administration
Federal Emergency Management Administration
U.S. Department of Housing and Urban Development
U.S. Department of Energy

These entities shall be requested to respond to the Department within a specified period of time, with their comments pertinent to their responsibilities and expertise, as identified by the Department. Initially, the request for input will be triggered by the publication of a NEPA document and notice of public input as provided by PL 95-604 and various state statutes. Subsequently, following the NEPA process, a request for input to the Department will allow final development of the Official Concurrence for the specific project.

The Official Concurrence of the State shall only be provided to DOE upon completion of the NEPA process, including public input and the review thereof, and before the Record of Decision (ROD) is issued by DOE.

All items of significance shall be resolved between the reviewing entity and DOE prior to the issuance of any concurrence.

It is understood that not all matters need to be resolved and stated in the NEPA documents. Of primary concern is an official commitment by DOE to honor the concerns expressed in the concurrence document during the conduct of the project (ie. disposal site selection, the excavation and transportation of the tailings, reprocessing of the residues, the off-site property remedial effort, and the final reclamation of both the original processing site and the new disposal location).

Any requests for comments on the Notice of Intent to be issued by DOE on a project, or a Preliminary Draft or Draft Environmental Impact Statement and Environmental Assessment, are not to be construed by DOE as requests for concurrence with that specific action. There will be only one Official Concurrence from the State on each project as previously stated.

The signatory of the State concurrence document shall be the Executive Director of the Colorado Department of Health.

Date Adopted ____________________

Frank A. Traylor, M.D.
Executive Director
Colorado State Health Department

State UMTRAP Radiological Engineering
Assessment Review

The Colorado Department of Health by state statute is the state agency authorized to implement the inactive uranium mill tailings remedial action program under PL 95-604, Title I. Due to this fact and that the Department has conducted the Grand Junction Remedial Action Program over the past nine years, the Department shall be the sole reviewer of proposals from DOE or its contractors regarding Radiological Engineering Assessments on vicinity sites, subsequent to the Official Concurrence of the State upon the completion of the NEPA process.

Implementation of the proposed remedial measures on such vicinity sites shall not occur prior to receipt of State approval.

The Department may call upon the Department of Administration, State Controller's Office and the Division of Purchasing, from time to time for advice on appropriate matters.

The State signatory for State approvals on vicinity site radiological engineering assessments shall be the Executive Director of the Colorado Department of Health, or his duly delegated representative.

Date adopted________________________

Frank A. Traylor, M.D.
Executive Director
Colorado Department of Health

COLORADO DEPARTMENT OF HEALTH

Richard D. Lamm
Governor

Frank A. Traylor, M.D.
Executive Director

June 9, 1981

Environmental Protection Agency
Central Docket Section
West Tower Lobby
401 M Street, S.W.
Washington, D.C. 20460

Gentlemen:

Colorado has long been concerned with the disposal of uranium mill tailings. Since the early 1960's studies have been conducted with the cooperation of others to determine the impacts from inadequately stabilized tailings piles. Finally in 1972, mill tailings were recognized by Congress as having a significant potential impact. This was the passage of PL 92-314 providing for the Grand Junction Remedial Action Program on buildings where tailings were used. Continued effort by the states and EPA resulted in Congressional action in 1978 with the enactment of PL 95-604 authorizing the inactive tailings pile remedial program and providing strengthening of the NRC and Agreement State programs to preclude another generation of inadequately reclaimed and stabilized tailings piles.

Within this state there are 9 inactive uranium mill piles at 7 general locations with a total of 11 million tons of tailings. There are approximately 7,000 off-site or vicinity locations contaminated by these 9 piles. Another 16 million tons of uranium mill tailings or residues do not fall under the remedial program addressed by Title I of PL 95-604. Proposed or new mills yet to come on-line will generate an additional equivalent inventory; however they will be handled right from the start in a more fitting manner commensurate with their long-term potential hazard.

Colorado's comments are predicated on the fact that there must be consistency in the criteria and standards of EPA, NRC, DOE, and the States', and that among these entities there must be continued consistency between the regulations and interpretations implementing these standards and criteria.

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Our specific comments regarding 40 CFR 192 as proposed are:

Subpart A.

192.03

a) EPA proposes a minimum of one thousand years where NRC requires a longevity standard of "thousands of years". The practicality of the matter is that the proposed EPA value would be appropriate if the protection parameters would not change over the thousand years. However, in a slight erosional environment, depending on the reclamation site, periods of thousands of years must be considered due to the peculiarities and erosional potentials of the specific site. The specificity of one thousand years is as inappropriate as is the concept of using geological time. We feel that periods of 10,000 years are practical and can be economically achieved.

b) The application of drinking water standards to ground or surface waters is problematic. Values for surface waters of Colorado generally vary from 10 pCi Uranium/liter in the higher elevations to equal to or greater than 100 pCi Uranium filter in the lower reaches of major river basins. This is primarily due to the solids content of the water. In Colorado, the alpha radioactivity of these solids range from 20 to 40 pCi/gram. Radium values ranges from less than 0.1pCi/liter to over 400 pCi/liter in groundwaters. These are not man-enhanced situations. The value for radium in drinking water was based on health impact and the ability to treat elevated levels. The value for uranium was based solely on health impact. Ability to treat waters with any degree of efficiency for uranium removal is questioned. I envision extensive usage of the exemptions proposed in Part C to "accomplish" any form of remedial action thereby identifying that the standards were improperly formulated as to efficacy of attainment and enforcement.

c) If a river was within the prescribed measurement distance (0.1 kilometer), a site could have significant leaching but still be within the standard due to the dilution by the river's influence on the unconfined aquifer. The use of two different measurement distances has an economic factor, however, it is questioned if the health impact might play a more important role. Further, the criteria should be idential to that applied to active sites as the hazard is identical.

d) Vanadium, thorium 230 and lead 210 should be added to the list of parameters in Table A.

Subpart B.

192.12

a) Under (a) no guidance is provided for DOE's "reasonable assurance" in the interpretation of these standards. Additionally, there is no interpretation on how the values are to be measured. Colorado has gained a great deal of experience in the implementation of the Grand Junction program. We foresee problems in the varied interpretations that have and will occur in the future on the proper and consistent measurement procedures.

b) In respect to the radium in soil standard, the determination of adequate cleanup should be determined in conjunction with secondary measurements, i.e. scintillometer readings, rather than solely by use of multiple soil analysis.

c) Under (b) the radon standard does not state the conditions under which the 0.015WL is to be measured. Radon daughter levels are highly dependent upon the conditions in a structure during measurements. Further, the standard does not state if 0.015WL is the maximum reading, or if it is the average of several readings. The statements that it is financially practical to lower concentrations greater than 0.017WL is questionable. Our Grand Junction experience indicates that the cost per radon daughter reduction at the 0.017WL point is between $1.5 and $5 million per working level reduction. Further on a statistical basis there will be approximately twice as many false positives undergoing expensive remedial action under the 0.015WL criterion as under the 0.017 criterion (assuming there is a standardized monitoring procedure - see above).

d) Under (c) the term "dose equivalent" is used and references (a) and (b). However, the maximum dose equivalent in rem as defined is not included in Table B.

Part C.

a) The exemptions provided in 192.20 and 192.21 are consistent with the practices in Grand Junction, which relates solely to the gamma and radon daughter values. As such we envision their proper limited usage. However, with regard to the other values, as stated before, we envision extensive use of the exemptions which indicates that the standards were improperly derived.

Again, Colorado expresses concern for consistency between agencies on standards and their implementation. We might be more concerned with how DOE intends to implement these Standards. When will their implementing regulations be available for review and comment?

Attached are a letter from the Colorado Department of Health's Water Quality Control Division and an internal memo from our Grand Junction office with additional comments. Thank you for the opportunity to comment on this standard.

Sincerely,

Albert J Hazle

Albert J. Hazle, Director
Radiation and Hazardous
Wastes Control Division

AJH:vb

Enclosures: as stated

COLORADO DEPARTMENT OF HEALTH

1876

Richard D. Lamm
Governor

Frank A. Traylor, M.D.
Executive Director

May 8, 1981

Environmental Protection Agency
Central Docket Section
West Tower Lobby
401 M Street SW
Washington, D.C. 20460

RE: Docket No. A-79-25 - January 9, 1981 Federal Register

Dear Gentlemen:

Colorado has several active or proposed uranium mills plus numerous inactive uranium piles. As we are an Agreement State with the NRC the Water Quality Control Division has provided technical assistance to the state licensing authority for several new and existing uranium mills.

At this time, the Colorado Attorney General interprets uranium tailings piles to be subject to control under C.R.S. 1973, 25-8-505. This section of the Water Quality Control Act addresses groundwater and requires one of two findings before the activity is permitted. The findings are: a) that no waters of the State will be polluted thereby; or b) that if waters of the State will be polluted thereby, the pollution resulting therefrom will be limited to waters in a specified limited area from which there is no risk of significant migration and the proposed activity is justified by public need. The Division has recommended finding b) above, for the one operation which has applied for a permit. Though distance and contaminant level criteria do not exist, the proposed design will provide reasonable assurance for groundwater protection. To be reasonably consistant with this Act, it is recommended that the proposed numeric limits be imposed at a distance no greater than 0.1 kilometers from either an existing pile or a relocated pile. Nondegradation should be the criteria when natural background levels exceed the numeric criteria. Part of the reason for this is the fact that, according to limited groundwater data in the 1977 Ford, Bacon and Davis Utah, Inc. reports on the inactive sites in Colorado, many of the piles have a potential for saturation during high stream flows. This being the case, it would be very possible for a pile to be impacting groundwaters yet not see the impact 1 kilometer from the site because of seepage migration into surface waters. As the placement of uranium tailings was previously based upon practicality and not good siting criteria, monitoring close to the pile will make it more difficult for a poor site to be accepted for final disposal. As saturation of the piles may be periodic, extended periods of groundwater monitoring may be required at existing sites to factually determine site adequacy for the 1000 year period.

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One additional reason for imposing criteria close to a site, is the fact that most if not all the inactive piles are located in semi-arid areas. As these same areas are being impacted by great population increases and increased energy activities, the demands on the limited waters are increasing.

The chemical and radiological characteristics of seepage from a uranium pile are dependent on factors such as leaching process, ore source, soil characteristics, etc. At the Cotter mill in Canon City, molybdenum and uranium were found to be two of the most mobile metals in the groundwaters. Selenium was found to be somewhat mobile and arsenic though present in ponds, could not be found in adjacent groundwaters. The groundwaters near other sites have shown elevated levels of thorium 230 and lead 210. Due to the fact that mobility of a given parameter at a given location will indicate its value as an identifier of seepage, the proposed list of parameters plus thorium 230, lead 210 and vanadium should serve as suitable criteria. At this time, a suggested numeric limit for these three parameters cannot be made. For a given site, once the best indicators of contamination are identified, the remainder of the parameters should be of secondary importance.

One additional criteria which should be included in the standards is the location of the final disposal pile out of the floodplain of a probable maximum flood event, for any adjacent drainage. Location within such a floodplain can cuase erosion as well as saturation of portions of the pile which will not allow compliance with the 1000 year cirteria.

The primary concern of this Division is that the proposed rules would make the acceptance of existing sites as the final disposal site too simple. It is very likely that none of the existing uranium pile locations in Colorado would be acceptable for siting of a new pile. As congress has determined that proper isolation of inactive uranium piles is needed, the standards should be sufficient to insure that the uranium piles are not left at a marginal site.

One general point of concern is the indication in the Federal Register that limited groundwater impact is occurring at most sites. In review of the specific site reports of 1977 by Ford, Bacon and Davis Utah, Inc. limited data was available upon which to make any determination. If the feeling of limited impact continues, it may bias the standards before they are finalized.

Should there be any question on these comments, please contact this office.

Sincerely,

Robert J. Shukie

Robert J. Shukie, P.E.
Unit Chief, Industrial Unit
Permits Section
Water Quality Control Division

RJS/ky

cc: Al Hazle

COLORADO DEPARTMENT OF HEALTH
Division or Section of Radiation & Hazardous Waste Control

INTER-OFFICE COMMUNICATION

TO : Al Hazle
FROM: Hal Langner
DATE : June 2, 1981
SUBJECT: Proposed EPA Cleanup Standards for Inactive Uranium Processing Sites

The following comments are essentially the same as those made by me verbally to Stan Lichtman upon his recent visit here in Grand Junction and are hereby put in writing in accordance with your instructions for you to transmit to EPA through the appropriate channels.

The most serious criticism that I have to make is that the proposed radon daughter criterion is not a standard at all because it doesn't state the conditions under which the 0.015 WL is to be measured and that in spite of the claim in the published announcement of the proposed standards that the radon daughter criterion is "unambiguous", it is a well known characteristic of radon daughter behavior that radon daughter levels are highly dependant upon the conditions at the structure during the measurements. In other words, you don't have a standard if you don't specify the standard conditions under which the measurement is to be made.

One of the arguments used to justify the 0.015 WL criterion is that the Grand Junction program has found it to be "usually technically and financially practical to lower concentrations greater than 0.017 WL when the high working levels are due to residual radioactive materials" and that "0.017 WL is practically indistinguishable from our level of 0.015 WL". Both of these statements are highly subjective judgements and, depending on one's point of view, could both be considered to be false.

Firstly, our experience in Grand Junction (data and graph attached) indicates that the cost per radon daughter reduction at the 0.017 WL point is between about 1.5 and 5 million dollars per working level reduction. Extrapolating our data to 0.015 WL indicates an approximate cost of between about 2.3 million dollers per working level reduction and infinity.

Secondly, whereas it is difficult to distinguish 0.015 WL from 0.017 WL in an individual structure due to the high variability of the radon daughter concentration under changing conditions, on a statistical basis considering several hundreds of structures, there will be approximately twice as many false positives undergoing expensive remedial action under the 0.015 WL criterion as under the 0.017 WL criterion.

The foregoing assumes that we are talking about an average of 0.015 WL measured under some as yet unspecified set of "standardized" occupancy conditions. If instead the 0.015 WL criterion means what it appears to say, namely that the maximum concentration within the "building shall not exceed" 0.015 WL under any conditions, then nearly half of all structures with tailings associated with them that do not however have elevated radon daughter levels will

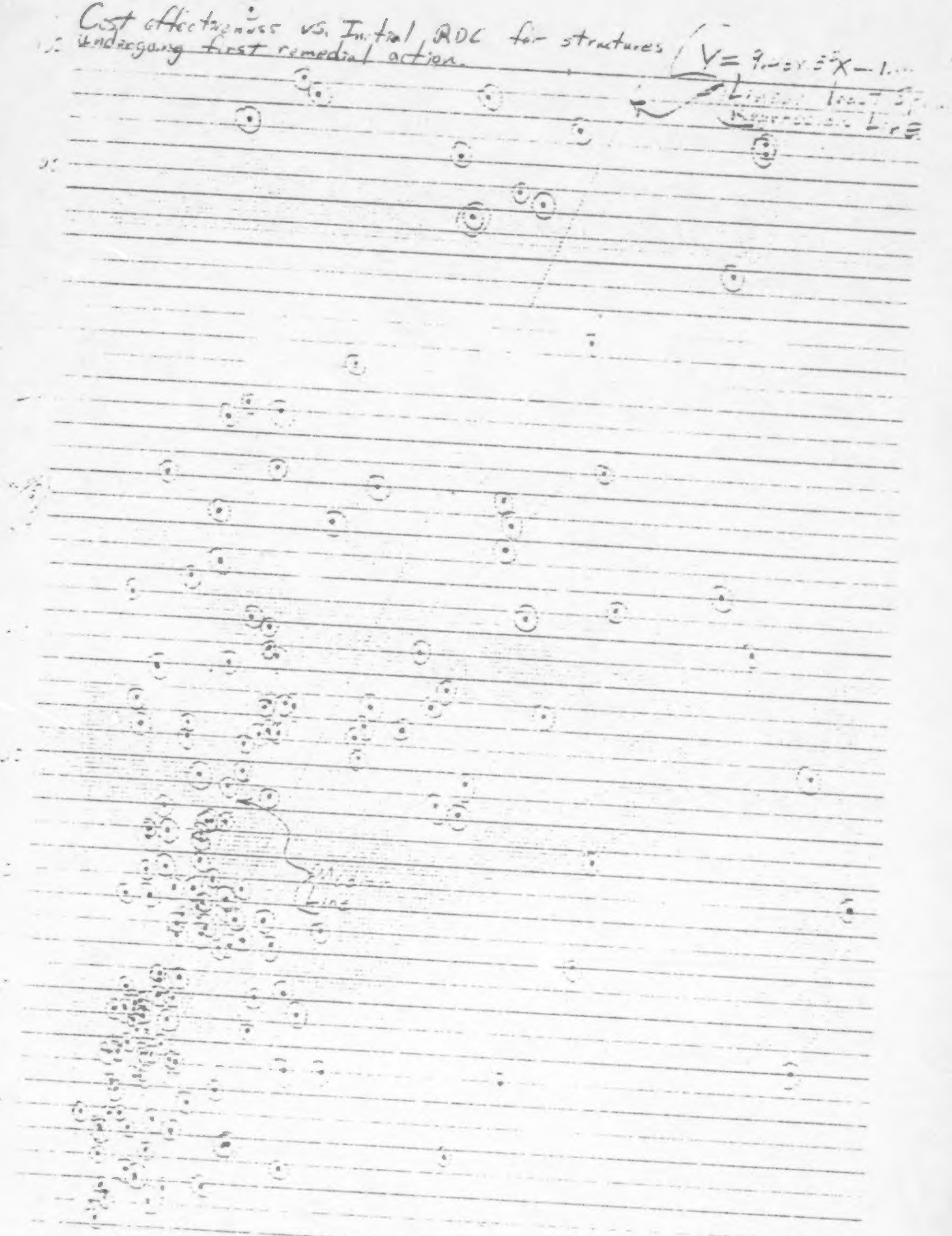
Hal
Signature

AD BUS-29 (10-29-100)

be false positives and will have to undergo expensive remedial action before it can be concluded that the radon daughter levels are not "because of residual radioactive materials".

With respect to the radium in soil standard, I have considerable concern that the way in which the standard is stated does not emphasize strongly enough that the intended objective is the use of surrogate measurements (such as scintillometer readings) to determine the adequacy of cleanup rather than, in practice, making a multitude of actual radium in soil measurements. Experience with regulatory agencies leads to the conclusion that if the guidelines can be interpreted to mean using an awkward, expensive, clumsy and inefficient way to do something, then they will often be so interpreted.

Cost effectiveness vs. Initial RDC for structures undergoing first remedial action.



These data are for only the first remedial action undertaken at each structure.

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PROGRAM   COSTEF
 INIT.     COST        UNIT     FINAL  DOLLAR          C
 RDC     EFFECTIV      COST      RDC.   COST    LOC.#  L
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 .052   1.16E-06    8.64E+05    .033    7711   00005  1
 .021   4.28E-06    2.34E+05    .005    3975   00006  1
 .056   1.41E-06    7.11E+05    .010   30699   00012  1
 .019   8.50E-07    1.18E+06    .006   15299   00018  1
 .051   4.51E-06    2.22E+05    .016    8417   00020  1
 .031   5.56E-06    1.80E+05    .007    4315   00023  1
 .112   1.79E-05    5.59E+04    .183   12800   00030  1
 .024   1.89E-06    5.31E+05    .008    8499   00031  1
 .119   3.31E-06    3.02E+05    .022   29279   00048  5
 .048   7.00E-06    1.43E+05    .005    6110   00076  1
 .022   4.91E-07    2.04E+06    .017   10191   00081  1
 .029   5.35E-07    1.03E+06    .019   11850   00083  1
 .200   1.03E-05    9.69E+04    .006   12900   00084  1
 .021   1.52E-06    6.56E+05    .010    7214   00092  1
 .058   1.87E-06    5.34E+05    .022   19223   00095  1
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 .208   8.70E-06    1.15E+05    .008   22987   00165  4
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"Colorado's Uranium Mill Licensing Actions"

Presentation by

Albert J. Hazle, Director

Radiation and Hazardous Wastes Control Division

Colorado Department of Health

at the

Uranium Law Seminar

June 12, 1981

Copper Mountain, Colorado

Uranium is an element named in honor of the planet Uranus; symbolically identified by a capital "U"; has an atomic number of 92; was first isolated as a metal in 1841; is as abundant as molybdenum or arsenic; has fourteen isotopes which are all radioactive, three of which are found in nature and are of eonomic importance. U-235 has a natural uranium abundance of 0.711% and is used as nuclear weapons components and fuel for nuclear reactors. U-238 is the origin of the uranium decay series and has a radioactive half-life of 4.5 billion years. The uranium radioactive decay series involves such additionally notable radionuclides as U-234, Th230, Ra-226, Rn-222 and its short-lived decay products, daughters or progency, Pb-210 and Po-210, all of which have biological significance. U-238 is used in the production of Pu, and uranium depleted in U-235 content is used as radiation shielding and counter weights in aircraft missles, etc. Uranium has also found use in the past as coloring for dinnerware, and in anal itch ointments.

With the demonstration that the fission process was a viable military weapons option in World War II, residues which contained elevated levels of U from vanadium ore processing were reprocessed for the Manhattan Engineering District Atomic Bomb Project culminating in the detonations at Hiroshima and Nagasaki, Japan.

With the end of World War II, the federal government embarked on a U procurement program to build an arsenal of atomic weapons, further nuclear weapons sophistication, and the development of the nuclear reactor energy option. Due to the strategic nature of uranium in national security, the control of radiation and radioactive materials was largely a responsibility of the federal government, particularly the U.S. Atomic Energy Commission. However, many of the aspects of radiation protection did not involve strategic or national security sensitive areas, and in 1959 the Atomic Energy Act of 1954 was amended to enable states to enter into agreements with the AEC for the regulatory control of source, by-product and special nuclear material.

Source materials are substances which have greater than 0.05% by weight uranium or thorium, are not unrefined or unprocessed ores, and are the source of special nuclear material such as U-235, Th-233 and Pu-239 which will fission. By-product material as then defined, included the radioactive residues from the splitting of an atom in the fission process. Special nuclear material is the substance which undergoes the fission process with the potential for releases of tremendous amounts of energy over a short period (the bomb) and over longer controlled periods (the reactor). Authority over special nuclear material was limited in state programs to amounts smaller than critical mass capability. State program authority over federal government installations or prime contractors was not authorized.

Kentucky became the first AEC agreement state in 1961 and Colorado became the 18th agreement states with Rhode Island being the latest addition in 1980.

At the time of Colorado's achieving agreement status, regulatory authority over uranium mills was also transferred in reference to the source material licensing responsibility for uranium mills.

Colorado had long been involved in the uranium industry's problems, starting with earlier efforts by the U.S. Public Health Service and other states in uranium miner lung cancer studies in the 1950's. During the 1950's and 1960's concern was also expressed for effluent discharges and dike failures at uranium mills operating under contract to the federal government for their procurement program. On at least one occasion Colorado Bureau of Mines inspectors were refused entrance into uranium mills to check for dust hazards in grinding and yellow cake areas, on the basis of national security. With the shut-down of the procurement programs contract mills during the late 1950's and early 1960's concern arose due to the lack of maintenance of the large volumes of sand fraction solid wastes or tailings. In December of 1966, with the issuance of a Joint Federal Agency Position Regarding Control of Uranium Mill Tailings agreement signed by representatives of the AEC, DHEW and the DOI, the Colorado State Board of Health adopted an inactive uranium mill tailings pile stabilization regulation with the support of industry. Another incentive for the adoption of this regulation was the identification that these tailings were being released from the mill site and used as building construction fill in Grand Junction. The major concerns at that time were stream and air pollution and the loss of regulatory control of a radioactive substance having concentrations at least hundreds of times natural background values. The initial efforts were directed toward rip-rapping stream-sides of impoundment dikes, the recontouring of the tailings to preclude water erosion, and the covering of the tailings with 6-8 inches of soil to prevent wind erosion. In the cases of the Durango and "New" Rifle piles, experimental stabilization by vegetating directly on the tailings were authorized by the State Board of Health. Later studies identified that the prime public health hazard potential associated with the tailings was the radon gas emanations from the tailings which the soil cover did not prevent, and the generation of radon daughters in confined air spaces of structures built with tailings.

When Colorado took over the regulation of uranium mills in 1968, it quickly identified problem areas in the 3 operating uranium mills previously sited and regulated by the AEC. In the case of Uravan and Grand Junction, these were old mills converted to uranium recovery. It was said on our first Grand Junction mill inspection that if the entire process flow was once stopped, it would have been impossible to restart the mill. With the lack of contracts the Grand Junction mill was shut-down in 1970 and reclamation of the site occurred in 1972. Uravan's history dated back to the days of Madame Curie, vanadium extraction, the Manhattan Project, the federal uranium procurement program and then private contracts for uranium production. Uravan's license in 1968 authorized the discharge of up to 90 pCi Ra/L of effluent into the San Miguel River. At one time the San Miguel

River did not contain any biota within the impact of the mill effluent discharge. Additionally, discharge points were difuse and not controlled. Subsequently, processes were developed, discharge collection and treatment reduced the mill effluent concentrations to levels orders of magnitude below the AEC and state effluent regulations and fractions of the drinking water standard. Impoundments for liquid treatment and raffinate disposal were located along or in the river channel and were apparently designed to allow seepage into the river. Correction of this situation is envisioned upon the shut down of the current mill operation as it exists today in approximately 2½ years hence, with removal of the ponds and their residues and proper disposal along with the 10 plus million tons of tailings. In the case of the Cotter-Canon City mill, this was a newer facility, however the location of the tailings piles without an impervious liner did allow contamination of ground water. Effort by the Radiation and Water Quality Control groups of the State Health Department addressed these matters, however total resolution of ground water situation required a new tailings impoundment and the relocation of the old tailings themselves. In all of these old generation "AEC" mills, the worker exposure to ore dust and yellow cake was of major concern with several notifications per year, as required by regulation, of over exposures. With the new milling facility at Canon City in 1979, worker exposures have been tremendously reduced and it is truly rare when an overexposure does occur. This can be compared against our archival records on the old Naturita mill where levels of yellow cake were so high that the sheet metal roofing was removed from that area to allow dilution air entry and yellow cake deposition was visible over the roof, across the mill yard and highway!

Upon the joint federal/state recognition of the problem attendant to uranium recovery and the wastes generated, regulatory efforts placed an increasing burden on the industry. Pressures were placed on various aspects of the process etc. attempting to address the problems piecemeal. Comments from the industry indicated that compliance was difficult when the target was continually moving, particularly in a downward or more restrictive mode. The states also had the moving target problem when confronted with the AEC's now NRC, one-upmanship regulatory effort. In 1977 the target came into view.

With the establishment of an NRC Branch position on uranium mill licensing in 1977, the tack was to make the requirements as restrictive as possible thereby precluding lower standards in the future. Therefore the target was at least stationary for both regulator and regulatee. This Branch Position was incorporated into the Draft Generic Environmental Impact Statement on Uranium and the Final document issued in 1980, which was the basis of the recently adopted NRC regulation and criteria on uranium mill licensing.

In 1978 Congress passed Public Law 95-604, otherwise known as the Uranium Mill Tailings Radiation Control Act of 1978, or UMTRCA. The basis for this act is what I have addressed earlier in my presentation, the clean-up of the old inactive uranium mill sites which were generated and regulated by the federal government and the sole buyer of the product, and the preclusion of developing another generation of mill site problem situations in the future. Title II of this Act requires that states amend their agreement for regulatory control of uranium mill tailings, now also defined as by-product material, by November 8, 1981, that their regulatory standards be equivalent to the NRC's, that states publish environment assessment of mill proposals and that provision of hearings with transcript be authorized. The NRC's agreement state program criteria has been published and will have to be met prior to amendment of the agreement. It also provided for dual NRC/State jurisdiction from 1978 to 1981 due to inappropriate wording which was later changed. States are now required to implement UMTRCA to the extent possible prior to November 8, 1981. NRC jurisdiction over Agreement State uranium mill licenses is limited to imminent health hazard situations where the state refuses or neglects to act. The NRC is to provide technical assistance to the Agreement States which Colorado makes great use of during the license review process.

There are three remedial programs and one envisioned addressing or that could address radioactive residues. The first one was authorized for Grand Junction in 1972 by Public Law 92-314, where tailings were used in construction. This program is voluntary and the last date for application for inclusion into the program was June 16, 1980. The project is about 66% completed and is anticipated to involve 700 structure at a total cost of $23 million of which the state must pay 25%. Closeout is anticipated for 1985. The second program was authorized in Title I of UMTRCA (PL 95-604) for the inactive uranium mill tailings piles, nine of which exist in Colorado. The highest priority sites are Durango, Grand Junction, Rifle (2) and Gunnison with the distinct possibility of having to relocate those tailings to a more proper disposal location. The current cost estimate for the Durango effort approximates $50 million. The original DOE estimate provided to Congress in support of the program passage was $62.5 million for all the Colorado sites, the estimate did not include meeting the new NRC criteria. Off-site or vicinity locations contaminated by mill residues will also be addressed, of which there are approximately 7,000 in Colorado. We have recently instituted, with the assistance of DOE, a building permit survey program in inactive mill towns to preclude new construction on contaminated properties, which has proven extremely cost effective in Grand Junction. The third remedial program is under the Superfund (PL 96-510) and will address inactive hazardous waste disposal sites including the Denver radium sites identified in 1979. The anticipated program which as yet has no legislative authority is the Formerly Used (Manhattan Engineering District/AEC) Sites Remedial Action Program (FUSRAP). These are several sites in Colorado which could be addressed by that program.

Enough of the past and federal efforts. Let us now turn to current state programs.

Colorado regulatory program for uranium mills and their attendant residues involve some rather detailed procedures. Upon application at this time, a licensing fee must be paid in whole or in part which will later be adjusted downward, possibly, depending in the actual state cost of the licensing review process. Some applications are still being processed that were received and considered complete applications prior to the establishment of the fee schedule. The review is extensive and is more all inclusive than an equivalent NRC review. Reviewing entities, local, state and federal involve about 35 agencies plus the general public and interested citizenry. Upon completion of the review and resolution of concerns, a preliminary executive licensing review summary is prepared which includes a project description, an environment assessment and discussion of the issues, and a draft license proposal. A hearing is then noticed along with a public comment period. If several agencies will need to issue permits, hearings may be held jointly which reduces time involvement for all parties and testimony problems if hearings are held independently. The conduct of all procedures is in accord with the Colorado Administrative Procedures Act (APA or 24-4-101 et seq, C.R.S. 1973 as amended) or as otherwise indicated by specific program statute. Upon completion of the hearing and the comment periods on the radioactive mill license application, a final executive licensing review summary is prepared and published. This includes a review of the comments and their disposition, a finding of fact and conclusions of law, and the license as issued. Mill inspections are annual as specified by regulation (similar to NRC). The inspection fee approximates a maximum of $2,300.00 total state cost. Proposed regulation changes would place the figure closer to the actual cost of $20,900.00. Follow-up inspections are done as required to determine compliance for major violations. Enforcement action is in accord with the APA and is limited to required license modification, suspension or revocation of the license. The NRC and the National Governor's Association have recommended that civil penalty authority be acquired. We did attempt to acquire such authority this session by HB 1231. The bill was killed in House Appropriations. All funds derived from the fee schedule, and the proposed civil penalties, go to the States General Fund. Colorado's program is funded by appropriation in the state's long bill via general fund and augmenting, normally federal grant or contract, funds. Over the past 5 or so years, the federal funds have been continually reduced.

In the 1978 edition of the Colorado Radiation Control Regulation, requirements were included for reclamation financial surety arrangements for specific classes of radioactive material licenses and also long term care and monitoring funds. Reclamation sureties include mill site, pipeline corridors and tailings impoundment stabilization which nominally amounts to a $10-15 million cost coverage guarantee. Mechanism of surety provision include all procedures including real equity but not including self insurance. Long term funds for monitoring and maintenance are based on annual cost and the corpus necessary to generate the annual interest to meet that cost. Normally the corpus here involves $1-2 million. Costs include visual inspections, surveys, sampling and analysis, fence, sign and road maintenance, plant and burrowing animal control, maintenance of drain and diversion systems and contingencies for recontouring and pump back systems.

Part of the equivalency requirement is met if the state adopts regulations that are consistent with those of the NRC. Due to state codification systems, the AEC and now the NRC does participate in the development of suggest state regulations. Currently the Suggested State Radiation Control Regulations are developed as a project of the Conference of Radiation Control Program Directors. The Conference is funded for this purpose by NRC, EPA and FDA. Concurrence of five federal agencies is acquired prior to publication of the suggested regulations. The five federal agencies are NRC, EPA, FDA, OSHA and NBS. Previously the suggested regulations were published by the Council of State Governments with assistance from the AEC and PHS. Colorado's Radiation Act (25-11-104(2), C.R.S. 1973 as amended) requires adoption of the suggested regulations except deviations are allowed with detailed findings and that public health is adequately protected. As the new NRC regulations and criteria have not been officially incorporated into the revisions of the suggested regulations, the detailed finding process must be adhered to in the adoption of these regulatory changes. Prior to hearings on proposed changes, meetings are scheduled with interested groups, the Board of Health briefed in the matter, NRC comments on the proposal received and changes made, and the recommendation on adoption from the State Radiation Advisory Committee (provided by 25-11-105 and Governor appointed) determined. Promulgation procedures are prescribed by 25-4-101 et seq, C.R.S 1973, as amended.

To meet the requirements of Sec. 274 o of the Atomic Energy Act, as amended by UMTRCA, no State statutory changes are required. As a result of the issuance of the recent NRC regulations and criteria for uranium mills and tailings, proposed Colorado regulation changes are proposed, along with other changes for compatability such as enginered protection if exposures are greater than 25% of the allowable. The NRC suggested state language has undergone some revision during the review process to make the proposed regulations more enforceable. The fee schedule changes reflect true state cost rather than being limited to the Radiation and Hazardous Wastes Control Division costs.

Concern has been expressed by the uranium industry and now a suit has been filed against NRC for its uranium mill tailings regulations and criteria. Unfortunately a state, if it wants to maintain its agreement status must have equivalent NRC regulations in place by November 8, 1981 and the agreement amended. Also, EPA and NRC have been challenged regarding the implementation of 40 CFR 190 standards. Again, the states must implement the standard or lose their agreement status. The Department therefore is persuing the adoption of equivalent NRC regulations and putting as license conditions the equivalent of 40 CFR 190 implementation requirements.

The above situation places the state and its licenses in peculiar situations. If the regulatory authority has to be returned to the federal government, there is no provision for federal acceptance of state licenses similar to the provisions of the suggested state regulations or Colorado's RH 3.19. Although the state is proceeding on the assumption that the NRC and EPA regulations will be upheld and is adopting them as regulations or specific license conditions, if the courts rule in favor of the plaintiffs the state may have to review its regulatory posture.

While Colorado has taken the stance of moving forward to maintain its agreement status, I have been asked to address what other states are doing. At the annual meeting of the Conference of Radiation Control Program Directors in May, I did ask a number of the uranium states about their actions in this regard. Utah and Wyoming are non-agreement states and while they do have some regulatory authority via water quality and air permits, the radioactive materials license and surety situations are totally the jurisdiction of NRC. Idaho and Arizona are returning regulatory authority over uranium mills to the NRC, at least for the time being. New Mexico, Washington and Colorado have the required statutory authority in place, while Texas is in the process of acquiring such authority. New Mexico, Washington and Texas will have to acquire regulation changes to be equivalent particularly in the financial surety arrangements area. New Mexico addresses long term care via a state fund, currently at $4 million, generated, at 10c per pound yellow cake produced up to a total of $1 million per mill. Colorado currently negotiates both the reclamation and long term provisions. Washington law requires an environment impact statement currently, while Colorado has been providing environmental assessment documents and hearings since 1979. New Mexico has provision for both civil and criminal penalties, Colorado only criminal, and Texas has both civil and criminal following court assignment of penalty. Hearings are required by state statute in Colorado when there is radioactive waste disposal and transfer of site ultimately to the state, while in Washington, New Mexico and Texas there is provided an opportunity for a hearing. In essence, an indirect result of UMTRCA might be a uniformity of requirements between states.

Colorado is currently involved with 3 litigation situations. These involve Cotter Corporation at Canon City regarding additional permits as a condition of licensure; Homestake Pitch project with regard to the state's issuance of the license and other permits,and a suit brought against the state and NRC for nonenforcement of UMTRCA provisions. Another indirect involvement is regarding the Cotter Corporation-Schwartzwalder Mine effluent contamination of a drinking water supply.

Let me summarize briefly. Colorado has been a leader in uranium industry regulation but there have been problems here and nationally. Remedial programs are being activated to preclude undue risk. Regulatory changes are being made and certain aspects are undergoing litigation. Problems, technical and legal, need to be addressed expeditiously and with common sense. Common sense is important when we are contemplating reclamation funds for an effort 30 years hence and long-term control efforts including 10,000 years. Colorado statutes and regulations are written in a positive philosophical sense to the effect it is the state's responsibility to issue licenses if the proposed action is adequate to protect health and the environment. Good regulatory programs protect both the public and the industry. Thank you.

Senator SIMPSON. Now, the second panel, Sheldon Meyers, Deputy Assistant Secretary for Nuclear Waste Management and Fuel Cycle Programs, U.S. Department of Energy; John W. Hernandez, Deputy Administrator of the U.S. Environmental Protection Agency; and William J. Dircks, Executive Director for Operations of the Nuclear Regulatory Commission.

Mr. Dircks is accompanied by John Davis, Director of the Office of Nuclear Materials Safety and Safeguards, and John Martin, Director of Division of Waste Management.

STATEMENTS OF SHELDON MEYERS, DEPUTY ASSISTANT SECRETARY FOR NUCLEAR WASTE MANAGEMENT AND FUEL CYCLE PROGRAMS, DEPARTMENT OF ENERGY; JOHN W. HERNANDEZ, DEPUTY ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY; AND WILLIAM J. DIRCKS, EXECUTIVE DIRECTOR FOR OPERATIONS, NUCLEAR REGULATORY COMMISSION, ACCOMPANIED BY JOHN G. DAVIS, DIRECTOR, OFFICE OF NUCLEAR SAFETY AND SAFEGUARDS, AND JOHN B. MARTIN, DIRECTOR, DIVISION OF WASTE MANAGEMENT

Mr. MEYERS. Mr. Chairman and members of the committee, I am pleased to participate in the subcommittee hearings on the status of the remedial action program established by title I of the Uranium Mill Tailings Radiation Control Act of 1978.

If it is agreeable to you all, I would like to summarize my remarks and submit the full statement.

Senator SIMPSON. Without objection.

Mr. MEYERS. Within the Department of Energy responsibility for the uranium mill tailings remedial action program is shared between the Offices of the Assistant Secretary for Nuclear Energy and the Assistant Secretary for Environmental Protection, Safety and Emergency Preparedness.

A project staff under the Deputy Assistant Secretary for Nuclear Waste Management and Fuel Cycle Programs is responsible for the required remedial action. Responsibility for the actual onsite implementation of the remedial action is in turn assigned to the UMTRA Project Office, which was established for this purpose within the Department's Albuquerque Operations Office.

The Environmental Safety and Engineering Division of the Office of Environmental Compliance and Overview has responsibility for radiological survey and designation of properties and for certifying upon the completion of remedial action that a site meets the requirements of the EPA standards.

I will present information on the status of both parts of the program, and Dr. William Mott, Director of the Environmental Safety and Engineering Division, who is here with me today, will answer any questions that you may have on the ASEP portion of the program.

Progress to date in implementing the act has primarily involved site and vicinity property designation, radiological assessments, project definition, coordination and preparation of necessary agreements with States and tribes, scheduling and estimating, environmental activities, site acquisition, and technology development. In addition, the selection of major project contractors is well under way and remedial actions at vicinity properties have started.

On November 8, 1979, 25 inactive processing sites were designated for remedial action in accordance with the act and priorities for performing remedial action were established with the advice of the Environmental Protection Agency.

The act also provides for the designation of those properties in the vicinity of the 25 designated processing sites which contain residual radioactive materials derived from the sites. Currently, 51 properties in the vicinity of the Canonsburg, Pa., and Salt Lake City, Utah, and one high-priority vicinity property near the Lowman, Idaho, processing sites have been designated for remedial action.

One of the most significant accomplishments in this project to date has been the evolution of a process of consultation with the affected States and Indian tribes. Coordination with the affected States and Indian tribes actually began before enactment of Public Law 95-604.

Immediately after passage of the act, DOE coordination efforts were intensified, particularly in those States and for those tribes where high-priority sites are located. The result of this coordination is an understanding with the States and tribes as to the requirements of the project and the relative responsibilities of the cooperating parties as defined in the act. Of particular importance is the responsibility of the States to acquire processing sites, where required, and to select and acquire final disposal sites.

To date, cooperative agreements have been executed with the State of Utah and the Commonwealth of Pennsylvania for the sites at Salt Lake City and Canonsburg, respectively. A cooperative agreement with the State of Colorado for the Durango site is near completion and one for the Navaho site at Shiprock is in preparation. With these agreements in place, the remaining arrangements for the rest of the sites should follow with little difficulty.

Preliminary schedules have been developed for each of the 25 sites based on certain assumptions regarding movement—or stabilization in place—of the tailings. The site schedules have been combined with schedules for other project tasks to produce an overall project schedule that shows all work being completed by September 1988.

The present project schedule assumes that the EPA standards will be issued in final form by the end of this year, which under the terms of Public Law 95-604 is prerequisite to the performance of remedial action at the processing sites. Thus, the present schedule for the project reflects a completion date 7 years from the date of the final EPA standards, as mandated by the act.

Efforts to identify candidate disposal sites for the tailings at the first three high-priority sites have been initiated by the States. These activities commenced at the request of DOE, pursuant to the provisions of the act that require the States to acquire disposal sites. The identification of potential disposal sites for the Shiprock site—Navaho—is being accomplished by DOE with the assistance of Navaho officials.

Utah, Pennsylvania, and Colorado have identified candidate locations for disposal of the tailings from the Salt Lake City, Canonsburg, and Durango sites, respectively. The sites will be analyzed in the EIS's for these processing sites. The search for disposal sites for the remaining high priority sites will be started later this year.

The Commonwealth of Pennsylvania is also working on arrangements for the acquisition of the Canonsburg processing site, following a determination by DOE that this acquisition is required for the purpose of performing remedial action at the site. An appraisal contracted for by the Commonwealth is scheduled to be completed by July 1981, and negotiations with the owner should begin shortly thereafter.

Work has started on Salt Lake City vicinity properties, using the interim EPA standards for structures and open lands published in April 1980. The cleanup of Canonsburg vicinity properties will begin this fall, with study and engineering tasks already under way.

Activities at the first Salt Lake City location, Fire Station No. 1, were officially initiated on May 26, 1981, and are scheduled to be completed in October of this year. Engineering for additional Salt Lake City vicinity properties is now in preparation.

The procurement process leading to selection of the major project contractors has been started following the development of the scope of these assignments, the request for proposals, and other documentation required for the procurement process.

The first competition, for the technical assistance contractor, is entering the proposal evaluation phase, with the selection to be completed in early September of this year and award of the contract expected by the end of the year. The value of the TAC contract is expected to amount to about $65 million over a 7-year period.

Proposals are about to be requested for the second major contract, the remedial action contractor. The RAC will be responsible for the design of the remedial actions at all 25 sites and for the performance of the work at the sites.

The value of this contract is expected to amount to about $340 million over a 7-year period. Selection of the RAC should be completed by the end of this year, with award of the contract to be accomplished early next year.

In summary, most of the prerequisite planning and organizational activities have been accomplished, and the project is ready to proceed with the NEPA activities for all the sites, to continue with processing and disposal site acquisition and to expand the cleanup effort on vicinity properties. As noted above the promulgation of the EPA standards is now on the critical path for the project.

Senator SIMPSON. Thank you very much.

John Hernandez, glad to see you. I believe this is my first opportunity to see you, having come back to see us after your confirmation and I look forward to your testimony.

STATEMENT OF JOHN HERNANDEZ

Mr. HERNANDEZ. Thank you very much, Mr. Chairman. I will read my paper and I believe it answers the questions that you asked the Administrator in your letter of June 3 and I think it speaks to each of these, and should it not, I will be glad to expound on each of them.

Mr. Chairman, I am John Hernandez, Deputy Administrator of the Environmental Protection Agency. I am pleased to be here to discuss EPA's responsibilities under Public Law 95-604, the Uranium Mill Tailings Radiation Control Act of 1978—the act.

I would first like to briefly describe EPA's overall program for radiation, so that you can see the context of our uranium mill tailings activities. And I will just briefly read the titles to these acts, they are all in attachment 1 to my paper and the various charges, but they start with Atomic Energy Act of 1954, and the Reorganization Plan No. 3 of 1970; the Public Health Service Act of 1970; the National Environmental Protection Policy Act of 1969; the Marine Protection, Research and Sanctuaries Act of 1972; Federal Water Pollution Control Act of 1973; the Safe Drinking Water Act of 1974; the Toxic Substances Control Act of 1970; Solid Waste Disposal Act, as amended, of 1976; Clean Air Act, as amended, of 1977; the act we are discussing today; and three Executive orders.

All of these deal with our responsibilities with radiation.

These 10 statutes and three Executive orders give us a substantial role.

In addition to developing regulations and guidance, EPA has an extensive program of environmental monitoring, and of assistance to local and State governments, and to other Federal agencies.

The Office of Radiation Prograns in EPA conducts frequent field trips to make measurements of ionizing and nonionizing radiation levels both indoors and outdoors throughout the United States. The program is supported by two laboratories that analyze air, water, and milk samples from across the country. These data are analyzed and models developed in order to determine the radiation dose that the general public receives and to estimate the likely effect of the radiation. EPA also maintains emergency response teams that are always ready to assist in radiological emergencies.

Under title I of the act, the Department of Energy, with the concurrence of the Nuclear Regulatory Commission, will conduct remedial actions at designated inactive uranium mill tailings sites in order to stabilize and control such tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public.

These remedial actions must ensure compliance with generally applicable environmental standards issued by EPA. The act directed EPA to issue such standards by November 8, 1979. The Department of Energy may not undertake implementing actions until EPA has promulgated these standards.

An inactive uranium mill tailings site includes those areas where the uranium was milled, adjacent lands where mill tailings were disposed of, and any surrounding areas contaminated by tailings. In some cases, the surrounding areas are inhabited; in other cases, they are not. Population densities near the sites vary greatly.

Extended public exposure to a radiation or other health hazard as a result of these sites can come in one of four ways: One, exposure in drinking water from surface or ground water sources contaminated by runoff or seepage from a site; two, exposure in homes to wind-carried tailings that include radioactive materials; three, direct exposure from gamma radiation emitted from the pile; and, four, exposure in homes built in the past on or with tailings, and the possible event that future communities will unknowingly do so the same.

The people at greatest risk from uranium mill tailings are those who live in homes built with or on top of tailings. To proceed with control of this type of problem, EPA has published interim standards for the cleanup of open lands and buildings at or near inactive uranium mill tailings sites.

This was on April 22, 1980, and the action allowed the Department of Energy to begin the process of cleanup of these areas immediately. These standards state the levels to which it is necessary to reduce the radiation from tailings on open lands and in buildings that have been contaminated as a result of the movement of tailings materials.

Public Law 95-604 also spoke to the need to control and stabilize uranium mill tailings in order to minimize or eliminate radiation health hazards to the public. EPA proposed disposal standards for the control and stabilization of tailings at inactive sites on January 9, 1981.

These proposals would set limits on the amount of radioactive and nonradioactive toxic materials that could enter the air or water from the tailings, and the standards provide guidance on the time period that the protection should last. Public Law 95-604 provides that these standards must also be consistent with the requirements of the Solid Waste Disposal Act to the maximum extent practical.

It is inappropriate for me to comment on the validity or any other aspect of inactive disposal and cleanup standards at this time, as the public comment period does not end until July 15, 1981.

EPA has already received many comments on the proposals and has held public hearings. These comments will be carefully evaluated in preparing final standards. Current EPA staff estimates are that revision and finalization of the standards will not be accomplished much earlier than January 1983.

The Department of Energy has taken some actions that do not depend on EPA's standards. They have signed agreements with some States as required by the act, established priorities for remedial actions, and done preliminary studies.

The degree to which EPA's delay in promulgating standards for inactive sites has affected DOE's schedule to date is difficult to determine. If EPA's final standards are quite similar to its proposed standards, and if DOE proceeds on the basis of the proposed standards, then the remedial actions may not be greatly delayed.

Significant changes in the standard may place DOE in a position where time may be lost, resources potentially wasted due to inflation or unnecessary activities, and remedial actions possibly delayed.

Standards for active mill tailings sites: Title II of the Uranium Mill Tailings Radiation Control Act gave the Nuclear Regulatory Commission explicit jurisdiction over mill tailings at active sites.

The NRC already had authority over uranium mills and has been licensing them for several years. Title II also directed EPA to promulgate generally applicable environmental standards for tailings at active mills by May 8, 1980. The NRC is responsible for insuring compliance with these standards when they are promulgated.

Public Law 95-604 also includes language with respect to the relationship of byproduct materials regulated under the Atomic Energy Act of 1954 and the Solid Waste Disposal Act and its amendments. The control of byproduct materials at inactive sites is to be consistent with, to the extent practicable, applicable requirements of the Solid Waste Disposal Act.

The EPA standards for active mills related to the control of nonradioactive hazards are to provide for the protection of human health and the environment in a manner consistent with applicable requirements of the Solid Waste Disposal Act. In turn, all requirements for permits under the Solid Waste Disposal Act are waived for active uranium mills.

EPA has already established some standards for active uranium mills under its authorities in the Atomic Energy Act and Reorganization Plan No. 3 of 1970. These standards are part of the Nuclear Power Operations Standards—40 CFR 190—promulgated in 1977. The provisions for uranium mills became effective December 1, 1980.

They limit the annual radiation dose that any member of the general public may receive as a result of operations of the uranium fuel cycle, including milling. They do not insure long-term protection to the general public as they do not apply to disposal of tailings. The NRC is charged with enforcing these standards. The EPA standards for active mills contemplated under the Uranium Mill Tailings Radiation Control Act would be in addition to the existing requirements.

Current staff estimates are that EPA will not be able to propose standards for active mill tailings before the end of 1982 and that promulgation of final standards will not occur before the end of 1983. The complexity of the issues and the need to obtain external reviews made it impossible to meet the original target dates.

In anticipation of eventual EPA standards for active sites under the act, the Nuclear Regulatory Commission promulgated new uranium mill licensing requirements on October 3, 1980. The Federal Register notice stated:

> NRC is aware that its regulations must be compatible with the generally applicable standards established by EPA; therefore, the NRC staff has been and will continue to coordinate closely with EPA on this matter. NRC regulations will be revised, if required, when EPA standards are issued.

One reason for the NRC's action was to allow "Agreement States" to have a program for mill tailings in place by November 8, 1981, as required by the act. The NRC acted to meet this deadline in Public Law 95-604 as a means of remedying EPA's failure to meet its schedule.

The American Mining Congress has now petitioned for review of NRC's action in order to prevent implementation of the new NRC requirements on the grounds that NRC has no independent authority to act in the absence of EPA standards.

I do not feel free at this time to comment on the specifics of the NRC regulations as anything that I say might be interpreted as a comment on EPA's proposed standards for inactive mills, which are still subject to public comment.

Mr. Chairman, that concludes my prepared remarks. I would now be pleased to answer any questions.

[The attachment to Mr. Hernandez' statement follows:]

Attachment 1

AUTHORITIES FOR EPA'S RADIATION PROGRAMS

	Authority	Subject
1.	Atomic Energy Act of 1954, as amended 42 USC 2011 *et seq.* (1970), and Reorganization Plan #3 of 1970	All federal radiation guidance functions, including guidance for: a) Occupational radiation exposure b) Medical radiation exposure c) Protective action guides d) Nonionizing radiation exposure e) Exposure to transuranic elements and Generally applicable environmental radiation standards, including standards for: a) Nuclear fuel cycle operations b) Radioactive waste disposal
2.	Public Health Service Act 42 USC 201 *et seq.* (1970)	Radiation monitoring, research, training, and technical assistance to states
3.	National Environmental Policy Act of 1969 33 USC 4321 *et seq.* (1970)	Evaluation of federal actions involving radiation
4.	Marine Protection, Research, and Sanctuaries Act of 1972 42 USC 1401 *et seq.* (1972)	Ocean disposal of radioactive waste
5.	Federal Water Pollution Control Act 33 USC 1251 (1973) and	
6.	Safe Drinking Water Act 42 USC 300f *et seq.* (1974)	Radionuclides in drinking and surface water.

Attachment I (continued)

7.	Toxic Substances Control Act 15 USC 2601 et seq. (1970)	Commodities containing carcinogenic (e.g. radioactive) materials
8.	Solid Waste Disposal Act, as amended 42 USC 6901 et seq. (1976)	Radioactive materials in wastes of all types
9.	Clean Air Act, as amended 42 USC 7401 et seq. (1977)	Airborne emissions of radionuclides
10.	Uranium Mill Tailings Radiation Control Act of 1978 (an amendment to the Atomic Energy Act) 42 USC 7901 et seq. (1978)	Uranium mill tailings
11.	Executive Order 10831 "Federal Radiation Council" (1959)	Federal guidance on radiation
12.	Executive Order 12088 "Federal Compliance with Pollution Control Standards" (1978)	Extension of EPA standards to Federal activities
13.	Executive Order 12148 "Federal Emergency Preparedness Management" (1979)	Radiological emergencies

Senator SIMPSON. Thank you very much.

Mr. William Dircks.

STATEMENT OF WILLIAM DIRCKS

Mr. DIRCKS. Thank you, Mr. Chairman. I am pleased to be here to discuss the progress toward compliance with the Uranium Mill Tailings Radiation Control Act of 1978. I would like to submit my statement for the record and I would like to summarize.

Senator SIMPSON. Without objection, so ordered.

Mr. DIRCKS. I would like to discuss our regulatory approach.

In 1976, we started the preparation of a generic environmental impact statement on uranium milling operations [GEIS] which evaluated alternatives for tailings control and disposal. Preparation of the GEIS involved extensive research, field measurements, and predictive model development.

The GEIS was issued in draft form in early 1979 and was subject to both peer and public review including two public hearings in Denver and Albuquerque. After full consideration of public and industry comments, the GEIS was issued with appropriate changes in final form in October 1980.

The approach taken in preparing the GEIS and in developing associated regulations is based on the longstanding principles of radiation protection espoused by the International Committee on Radiation Protection [ICRP] and the National Committee on Radiation Protection [NCRP] and the Commission through its regulations such as 10 CFR part 20—that radiation exposures to individuals be kept within appropriate limits and that exposures to radiation be reduced to as low as reasonably achievable—social and economic considerations taken into account.

We concluded that any solution which requires institutional controls to keep people away from tailings sites and to maintain the site for very long periods of time is not a complete solution.

In view of the longevity of the hazards involved, it would be an uncertain and expensive one. Tailings disposal is better accomplished primarily by durable physical barriers, such as earthen covers which are protected from erosion, and which do not need indefinite long-term maintenance and monitoring. This is the approach taken in the NRC regulations.

We found that there are tailings disposal techniques which can be implemented at reasonable cost and which permit the return of disposal sites to conditions which are essentially the same as those of surrounding environs, without the need for continuing active maintenance.

The NRC approach is consistent with the specific mandate of UMTRCA that every reasonable effort is to be taken to stabilize tailings in a way that prevents or minimizes radiation emissions and other tailings hazards and, if practicable, do so in a way that eliminates long-term maintenance and monitoring.

Since May of 1977, the staff has used criteria which are comparable to the now effective regulations in working out tailings management programs at five new mills within NRC's jurisdiction in Wyoming and Utah and five new mills in the agreement States of Colorado and New Mexico.

These 10 new mills, which have been licensed or are in the latter stages of licensing, have established tailings management and reclamation programs which substantially comply with the NRC regulations.

Upgrading of active, ongoing operations where tailings piles already existed, proved more difficult than establishing a disposal plan for new mills. However, by applying licensing criteria to the maximum extend practicable on a case-by-case basis and through the conscientious and innovative efforts of the operators, upgraded tailings management and reclamation programs have been developed at all active mills under NRC's jurisdiction, and at some mills in agreement with States, as well.

Senator **Domenici**. Could I interrupt to distinguish whether you speak of working out arrangements with a new mill, that is to be distinguished from an old, but yet active millsite?

Mr. **Dircks**. That is right.

Upgraded tailings management and reclamation programs have been established for all existing mills within our jurisdiction in Wyoming and Utah. In addition, the agreement States of Colorado and Washington have used NRC licensing criteria, with our technical assistance, to upgrade tailings management programs at existing mills within their States.

In summary, we have had extensive experience in applying criteria like those in our regulations under actual conditions in both agreement and nonagreement States. The costs to the industry as they developed detailed tailings management programs are consistent with those used in the GEIS and in developing our regulations.

Now I will discuss the status of NRC activities to work out amended agreements with the agreement States to conform their regulatory programs to UMTRCA.

Agreement State involvement in the uranium mill tailings regulatory development process began prior to UMTRCA. During the preparation by NRC of the GEIS—beginning in 1976—agreement States were consulted and their comments included.

Following enactment of UMTRCA, we took a number of steps to assist the States in obtaining amended agreements. We initiated correspondence and meetings with the agreement States regarding the various aspects of UMTRCA.

A meeting was held with the uranium mill States in Denver on January 10 and 11, 1979, to discuss the act and its requirements for agreement States. Letters were then sent to the States alerting them to the need to begin to prepare for an amended agreement with the NRC and specifying the actions that would be necessary on their part. A followup letter was sent to the States on December 26, 1979, specifically stating what requirements the State would have to meet.

During this time, we worked with the agreement States to develop the NRC criteria for amended agreements. A preliminary version sent to them in July 1980 was discussed at a working session in October 1980. These criteria were published on January 23, 1981—at 46 F.R. 7540—and are entitled, "Criteria and Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement."

This document was a revision of an existing policy statement of the Commission on criteria for States which wished to enter into agreements. The additional criteria specifically addresses what is needed for an amended agreement: Statutes, regulations, organizational relationships within the State, personnel, certain functions to be covered, and instrumentation. Suggested State regulations were developed and sent to the States for their use. The States have followed the suggested regulations closely.

As development of the State programs proceeded, we reviewed and provided comments on the adequacy of their statutes, regulations, procedures, staffing, and other aspects. Comprehensive reviews were made by the staff in the summer of 1980 and the States informed by letters of the results.

In response to revised submittals, the Governors, in early 1981, were informed by the Chairman of the NRC of our assessments of the status of the State's efforts. Currently, to minimize correspondence and facilitate the review process, we have offered to send NRC review teams to each milling State to review the details of the State's program prior to submittal by the Governor.

In addition to the above activities we provided grant money to the States as permitted by UMTRCA to help finance their program development. We also established and sponsored training courses in the safety aspects of uranium milling for State personnel to increase their competence in regulating uranium millings.

The NRC has devoted timely effort in assisting the States with the development of programs suitable for amended agreements. Based on current available information, there appears to be considerable momentum and dedication on the part of the agreement States with active uranium mills to meet the November 8, 1981, deadline for an amended agreement.

We are looking forward to submittal of the final version of these programs in August and September, which should allow sufficient time for our review and administrative processing.

New Mexico has requested an extension of time but not because of scheduling difficulty. The NRC's regulations are being contested. New Mexico would prefer to defer the adoption of the regulations until the judicial proceedings are completed and thus avoid a risk of having to repeat the State adoption process. Representatives from New Mexico are present today and plan to present testimony. In summary, although the schedules are tight, we see no need to extend the November 8, 1981, deadline.

I will now turn to EPA's role.

Title II of UMTRCA gave EPA the responsibility for promulgating generally applicable environmental standards to be applied at active mill tailing sites within 18 months of passage of the act. The inability of EPA to complete this task on time has not affected our mill tailings regulatory program.

Since late 1976, we have established a comprehensive mill and tailings regulatory regime by the use of staff-developed interim criteria and the issuance of formal regulations in 1980 based on the comprehensive GEIS.

There could only be a significant impact on our program following subsequent issuance of EPA standards if those standards differ substantially from our own. We do not believe that this will happen since our respective staffs have been working closely on the subject and there does not seem to be any divergence of substance.

That concludes my prepared remarks, Mr. Chairman.

Senator **Simpson**. Thank you very much, Mr. Dircks.

Dr. Hernandez, I do appreciate your being here today, I know some of the limitations you speak of and they are very real because of your early presence in this arena here in Washington.

But I do feel your presence here today is indicative, I hope, of the interest and attention that you and Anne Gorsuch will be giving to EPA radiation programs. In my view, having management attention to that program within EPA is sorely overdue and you, sir, now are senior management. But before coming to a few questions, I have a broader interest and I want to share it with you and with Anne Gorsuch and I believe it would be very useful to this subcommittee to devote another hearing at a later date for exploring the full range of activitiy of the EPA radiation program office. I know that you and Anne Gorsuch would like the opportunity to review that program thoroughly yourselves and determine what changes might be warranted.

In my mind, there are some serious deficiencies there and I will share that with you without going through anguish in the process.

If you, sir, could begin to gather that information and see what you want to share with us, perhaps over the next couple of months, I assure you that we will hold a hearing fairly and expeditiously and to examine the operation and workings of that office in some detail, including its priorities and its use of resources and the practical nature of its results, its pragmatic existence. I want to cooperate, I assure you of that.

On the subject of tailings, I believe that you will see, or have seen, the frustration on the part of members of this subcommittee over EPA's failure to promulgate its general environmental standards for uranium mills and mill tailings within the prescribed statutory time period.

Although certainly that failure didn't come about during your tour of duty, it does clearly become a responsibility for you to somehow gather it all together, again.

Therefore, if the subcommittee decides to retain the EPA standard setting authority in this area, I would necessarily hope that you might give us a commitment to make that a high-priority effort to avoid further unnecessary problems in this area which you have already heard today and know of.

With all that, having ventilated myself, I have a few questions.

According to a letter to the subcommittee last year, from Mr. Costle, EPA had a schedule calling for the issuance of final cleanup and disposal standards for inactive sites in September of 1981, and for the issuance of final operational cleanup and disposal standards for active sites in May 1982.

Is that still your present schedule?

Mr. **Hernandez**. Mr. Chairman, I believe in my testimony I indicated some staff supplied dates that are a little bit beyond those that were in that September 1980 letter from the previous Administrator. And I might reiterate our best estimate, the review and finalization of both of cleanup and disposal of existing sites probably sometime in late 1982, but looking for a target date of January 1, 1982, for absolutely sure.

The time for publishing proposed standards for active mills, something in 1982, and finalization of those somewhere in the order of December 1983.

Senator SIMPSON. As you shared that timetable, I saw bureaucratic smiling coming from the back of the room, at various locations, but more power to you.

Mr. HERNANDEZ. Mr. Chairman, I think that one of the things we want to avoid is providing you with unrealistic deadlines to say by going the crash course we can meet this or that or the other. I believe that my discussions with the staff earlier in the week or so that preceded this where we obtained those dates from them, I think we are going to stay with those right now.

Senator SIMPSON. Having come to know you, I believe you will, too.

As you know, those schedules are far beyond the deadline set for EPA action in the Mill Tailings Act, deadlines, I might add, that were in excess of the time EPA estimated that would be needed to develop the standards. Why has EPA been unable to meet those deadlines? Do you have any comment on that?

Mr. HERNANDEZ. In my paper I indicated some of the reasons and I do believe that they are valid, and that is the complex or the need to go through a three-agency review, a public participation hearing process. As an example, we have something between 40 and 60 comments right now on our proposed cleanup and disposal of inactive proposed standards and each one of those will have to be broken down into separate items and every valid comment must be spoken to in the Federal Register and in our final version, and the final version has to go out for review.

So, it is a difficult and lengthy process.

Senator SIMPSON. If Congress decides to retain EPA standard-setting responsibility, and that is made a higher priority matter within the agency, how soon would you believe the EPA could develop the final inactive and active site standard?

Mr. HERNANDEZ. Mr. Chairman, at the point of seeming nonresponsive, I really believe that until we obtain the kind of mastery we feel is necessary over the situation at EPA—this is one of many instances where due to court decrease or other congressional deadlines, we are facing a serious situation of trying to meet various kinds of mandates and I would prefer to stay with the dates that I provided you within my testimony at this time.

Senator SIMPSON. I hope that as you settle in with the job, and I know that that is important, we will be able to hear from you as to what benefit would be served by retaining the EPA's authority, whether you will be able to recommend eliminating EPA authority for those active sites; we would like to pursue that further.

As a practical matter, does not it make some good sense to follow the integrated regulatory program that was set up by the Mill Tailings Act, that was, first to develop the EPA general environmental standard, then to have the NRC finalize its detailed regulations assuring they will be consistent in all respects with the EPA standards, and that they try to provide a comparable level of protection, and then to require the agreement States to upgrade their programs consistent with the EPA standards and NRC regs.

Mr. **Hernandez**. I am very supportive of that process itself. I am going to talk about an issue that is going to have other ramifications with EPA. In general, people who design criteria should not be doing the regulating and then the same group doing the construction themselves. In terms of the inactive site, I believe that is where the good process, those standards were providing, were in fact criteria for the NRC regs which would then be applied by DOE and I think it is a good process.

Senator **Domenici**. You think it is good for active sites, also.

Mr. **Hernandez**. Yes, sir.

Senator **Domenici**. You said inactive a minute ago.

Mr. **Hernandez**. I did specifically, but I think it is a good process for the active sites, too, sir.

Senator **Simpson**. In fact, doesn't NRC's uranium mill licenses establish general environmental standards such as radar release limits that should really be EPA responsibilities?

Mr. **Hernandez**. That is correct.

Senator **Simpson**. I hope you will be able to assist us in what extent there is this uncertainly in obviously not just a potential for inconsistency but a real inconsistency within the EPA standard and the NRC regs that—now given the fact that NRC started first.

Mr. **Hernandez**. There is one way they thought about, and I have not discussed this with the staff, that I have thought about for accelerating this process. If we looked at the EPA's role of one of setting basic criteria, that would then form the foundation for the NRC regulations. It would be, I think, a fairly clean proposition for us to come forward in a more timely fashion. One of the things that precludes us from doing that now is that we are already in that process of looking at a proposed disposal standards for the inactive sites.

And these proposed standards are not just criteria in a simple cut. I think there are things that could be described as not only some basic criteria but will have some manner and methods sort of things in there that tend to make this messier. And perhaps stepping back one step and trying again we might be able to do that in a more expedited fashion.

We have done the environmental impact statements on these things and using those as the foundation and the comments we have received so far, we might make a clearer start.

That is just one way of proceeding.

Senator **Simpson**. I will ask my colleague if he has questions at this time.

Senator **Domenici**. I have a few.

Mr. Dircks, in reference to what I said, you were in the room when I have been asking questions before, let's be very specific. Is it NRC's position that they will not approve an agreement State's proposal to remain an agreement State in this area unless they agree to comply specifically and exactly with criteria No. 6?

Mr. **Dircks**. I don't believe that is accurate. We have tried to make it clear to the States that they can adopt their regulations in line with their local conditions. We do have some specific new miracle requirements in there but generally the regulations have been phrased in terms of performance objectives and what we tried to do is work with the States, get comments from the States that would allow them to develop regulations that, to the extent we can comply with the act, make them compatible to the amount and extent practical to our old regulations.

Senator DOMENICI. What has been the challenge in court to these proposed criteria?

Mr. DIRCKS. The challenge in court, I guess, is one that we have issued regulations in advance of EPA—I had better have our lawyer summarize what the court said.

Mr. SCHAEFER. I am Howard Schaefer, Executive Legal Director for NRC. The main issues are whether NRC must await EPA standards before promulgating his own; an allegation that NRC is unlawfully implementing the EPA standards for uranium fuel cycle, 40 CFR 190; whether NRC's requirements are practical, reasonable, and authorized; and whether or not the cost of regulation bear any reasonable relationship to its benefits; and finally, whether the regulations are arbitrary, capricious, or not in accordance with law.

Senator DOMENICI. Thank you.

Mr. Hernandez, do you believe that it is critical to the orderly process of regulating that EPA promulgate standards before NRC attempts to enforce regulation? I am speaking now of this area.

Mr. HERNANDEZ. Mr. Chairman, Senator Domenici, I think the process that was initiated was a good one, thought out the ideas of how you go about setting those health standards. As I understand it, there was a panel that came first, a report that came forward on health criteria and these led into other things and I think the process of EPA establishing what kinds of criterion, standards are necessary is a good one, and while I wouldn't say it is absolutely critical, it is what we have set up and I believe we should probably stay with it.

Senator DOMENICI. Let me tell you what bothers me here. I don't know whether that lawsuit has any validity or not. As I read your testimony, and then the chairman has asked you again about some time frames, it would appear to me that either EPA is relevant to this process or they are irrelevant. If they are relevant, then they ought to set the standards. I think it is rather cavalier to anyone and I hope you didn't employ in your testimony that NRC ought to go about its business of enforcing and sooner or later EPA would come along with standards. That sounds fine in terms of this room, it appears to me from the standpoint of those to be regulated, it is economic disaster.

You can't begin to enforce and then say in 3 years, we will have the standards ready, we can't do it any quicker, we are sorry, it is very complicated. It is either one or the other. Either you are meaningful to the process or you are not. If you are, it would appear to me it is rather difficult for regulated industry to sit back and say, we will take the medicine now and maybe EPA will come out with something similar.

On the other hand, if they find what NRC was doing was too stringent, what then do they do? We have the ball bouncing back and forth in a short period of 2½ years and I think you have been doing that at the State level. I think you would agree regulators wouldn't like to act on homebase industry and mining operators and the whole economics of some communities.

Wouldn't you agree that is a rather fragile arrangement for State regulators to act on?

Mr. **Hernandez**. If I was back at State level and this happened, I would be up here to see you about it. I think it is one of those things that we have to let people know what in fact we are going to do. I believe that EPA's final version of the inactive site standards should give that kind of indication of what we anticipate doing on the active sites. So I believe in that sense we would be sending an appropriate signal even though we may take some more time getting those out. I think the crucial deadline at this point is to put out the final version of the standards for inactive sites.

Senator **Domenici**. Maybe I missed your testimony. First of all, there is a significant difference between inactive sites and active sites from the standpoint of who is going to pay the tab, you are now acting on the assumption that you are going to have some standards, you have been negotiating based upon them.

Can you give the committee any estimate as to what it is going to cost to clean up the inactive sites based upon the standards and modus operandi at this point?

Mr. **Meyers**. The approximate cost is $470 million for 25 inactive tailing sites.

Senator **Domenici**. How many more do you have in the country that ought to be cleaned up if that is an appropriate approach?

Mr. **Meyers**. Under the current law, we surveyed all areas and came up with 3 additional sites and 22 in the original law and as a result of our survey we came up with 3 more. As far as I know, that is with regard to mill tailing centers. I think we got the mill tailing well in hand.

Senator **Domenici**. Was there an authorizing level to pay for that?

Mr. **Meyers**. I believe the number of the bill was $132 million.

Senator **Domenici**. Have we appropriated anything else?

Mr. **Meyers**. Yes, sir.

Senator **Domenici**. How much?

Mr. **Meyers**. In fiscal year 1982, $13.2 million.

Senator **Domenici**. And today the work that we thought to be done for $132 million is presently going to cost?

Mr. **Meyers**. $480 million.

Senator **Domenici**. How confident are you of that figure?

Mr. **Meyers**. It is a much better estimate. As Dr. Hernandez said, giving cost estimates based upon flimsy data is not a good thing to do. We have done a good deal of work the last couple of years that gives us a better feel of what the cost will be. Until we actually get to the sites, start working the individual piles, know where they are going to be moved, it won't be until then that we get firmer cost figures.

But the kinds of factors that influence the increase in price have to do with just adding more sites, the fact that fuel costs have gone up, the haulage distances where we would have to move the various piles to and from have increased, it is factors like that.

Senator **Domenici**. Let me ask you: You have given us an explanation of why the cost went up almost threefold. You have given us your idea that it won't go up threefold again. That is a much better estimate than the $130 million. What effects have the standards that have been set had on that price, do you know?

Mr. **Meyers**. Not specifically. But one of the factors that affected the current estimate increase was the requirement to put the 3 meters on. The original discussions I think had 2 or 3 feet of overburden and the current regulations requiring something like 10. So there is more earth that has to be moved plus increase in the cost.

Senator **Domenici**. Did you do any investigating with DOE as to what the standard ought to be, the criteria?

Mr. **Meyers**. Let me ask Dr. Monehan.

Mr. **Monehan**. We have provided comments to EPA concerning our impressions about the standards and how they would impact the program as it went on. In terms of detailed recommendations, we have refrained from doing that for the time being.

Senator **Domenici**. Do you have any such evaluations that you would feel free to give to this committee?

Mr. **Monehan**. I think the main thing we would be finding additional comments on the environmental impact statements in attempting to take information out of there and see how it supports the numbers that EPA has put forth.

Senator **Domenici**. I don't want to change directions in midstream, but I have grave doubts that $400 million is going to come in right.

I think it is going to be like a half-billion or more and I have grave doubts whether you are going to get this Congress to appropriate a half-billion dollars for this job and that leads me to be concerned about that kind of estimate.

There may be some options that, in the minds of reasonable men, would be a good step forward that would not be as stringent as this that we might get done.

I understand, Mr. Chairman, and I say this with just some exchange between committee members, but I understand the Armed Services Committee is going to have hearings on this issue also because they think it is a half-billion dollars.

I don't know how you evaluate problems of this type, whether it is a $½ billion, $2 billion, or $150 billion. I think it would be worthwhile at some point in time if we are going to amend this act at all to perhaps provide some leeway for some optional approaches if it is really going to cost this much money. I am more interested in not destroying the agreement States as to active sites at this particular point, because I don't want to close a crimped industry in my State and I don't have any reluctance in telling that that concerns me greatly.

I have two more questions and I thank you for your indulgence, Mr. Chairman.

Let me ask Mr. Dircks, have you found the State of New Mexico in terms of both its policy group, the board, and seven-member technical group, have you found them to be cooperative, have you found them to have sufficient expert knowledge in this area or not?

Mr. **Dircks**. Yes, sir, we found them to be cooperative. We worked closely with them, we are working closely with them. I think as we get into the area, we have cooperated closely in looking at the new mill licensing effort down there and we work closely in that regard.

Senator DOMENICI. There will be a witness later in the day who will indicate that he believes New Mexico has the history of procrastinating in this area, a history of inadequate technical advice, that their staff has been historically poor. I an looking for someone to ask that question because I don't have expert advice.

I would ask you if you find that to be a true statement or not.

Mr. DIRCKS. We have worked closely with the staff of the department down there. We have just recently made an appearance before the board. We have not had that much operating experience with the board itself. We have worked closely with the staff and we found them to be competent.

Senator DOMENICI. I don't want you to say anything you don't feel comfortable in saying. I ask the question very specific, have you found that staff, as far as radiation is concerned being historically poor in your judgment?

Mr. DIRCKS. We have found them to be generally competent whether we look at the other States we work with and we don't have any complaints.

Senator DOMENICI. Thank you, Mr. Chairman.

Senator SIMPSON. I have a couple of questions for Mr. Meyers and then one or two of Mr. Dircks.

To what extent, Mr. Meyers, if at all, would the NRC criteria and the EPA proposed standards require moving the tailings from different sites to new tailings disposal sites, what would be the cost of moving those tailings for the new site, both in perhaps money and also in worker exposure, worker injuries, and do you believe that action is warranted in each case as opposed to on-site stabilization of the tailing?

Mr. MEYERS. Let me answer that a little bit in a roundabout way. Of the 25 tailings sites, our current estimate is that approximately 9 of them may have to be moved. And whether or not they will be moved will depend upon the environmental analysis that we do. That factors in a number of things, including the EPA standards and the NRC regulations. For example, one of the sites in Salt Lake City is a couple of miles from downtown Salt Lake City, the city grew around it. I think the officials in the State of Utah would like to see that mill tailings pile moved. It may or may not be able to be fixed in State and that would be determined by the environmental impact statement.

The last number I saw in terms of the near rest site was 90 miles away. So, combination of the requirements of the community, the regulation, and the environmental analyses, it will be that kind of mechanism that we use to decide whether there is a movement of the pile or fixing in place. Also the factor you mentioned in terms of exposure to workers, community, et cetera.

Senator SIMPSON. And whether that would even be economically feasible, unless of course the Federal Government did it and then automatically it would be feasible.

Mr. MEYERS. In this program the State pays 10 percent of the bill, it is not a frivolous thing for the State to say go move. They have to come up with 10 percent of it; a rather large number to do that.

Senator **Simpson**. Certainly a 90-mile transfer of tailings would be a tremendous expenditure.

Mr. **Meyers**. Another example is the Durango site which is on the banks on the river, the Grand Junction pile is literally on the banks of a river.

One can stabilize a place as best you can, but if you were given a preference, it would be desirable to move it away from the banks of the river.

Senator **Simpson**. I think all would concur with that.

In your 1980 annual status report on the uranium mill tailings remedial action program, you stated that EPA is made to clean up standards immediately effective as interim standards in order to satisfy the requirements in the mill tailings standards whose standards must be promulgated before DOE cleanup can be undertaken.

That is an interesting ritual. In your testimony today you seem to now suggest that EPA's interim standards do not start the 7-year clock running. Do EPA's interim cleanup standards satisfy the act's requirements and is the clock now running against DOE?

Mr. **Meyers**. Everything associated with this program, it is not all that clear.

Senator **Simpson**. Including the clock.

Mr. **Meyers**. I am told by our attorneys with regard to the offsite properties we can use the interim standards to begin cleaning up the offsite properties we have.

I have also been advised that insofar as cleanup of the tailings piles themselves, we need to have that criteria published in final form. So we have not started the cleanup of any of the tailings piles because the regulation is not final. But we have started work on the offsite properties.

Senator **Simpson**. I regret the time alone is the only determinant or I could certainly wish to go on there.

I have a question of Mr. Dircks.

In October of last year the NRC promulgated its final implementing regulation for the act and those regulations provided among other things that the radon exposure should not exceed 2-picocurie square meter per second or 3 meters of Earth. You know in support of those standards that they will insure that conditions at the site are returned as far as possible to normal and, what health effects do you expect to avoid by imposing 2 picocurie limit on radon emissions? And have you estimated the cost of compliance with that requirement, and what would be the difference of health requirements one would expect from a radon emission level of 50 picocurie of square meter per second?

Mr. **Dircks**. Let me talk about the Earth cover, first. We took that as a needed requirement to stablize the sites so that there would not be a need to monitor and maintain those sites.

We have had some unfortunate experiences in trying to stabilize tailings piles with less cover than 3 meters, not only in the radiation area or the mill area, but also when we tried to stabilize strip mines for other fuels. So we took the 3 meters as a way of assuring that you will get a stable permanent cover on the piles. Otherwise, we will be going back and doing remedial programs from now on if we do not stabilize them right the first time.

Also connected with that Earth cover is the standard or 2 picocuries per square meter per second above background time. This is a number we arrived at, not only from the point of view of what would result from an Earth cover, but was also based on the analysis we had as to what we can achieve at a reasonable cost. The cost estimates we did went into this aspect very thoroughly, and they are in the impact statement.

The way we calculate the cost, if the mills are newly licensed the estimates come out to about 1 percent of the price of the pound of yellowcake for the stabilization program.

Senator SIMPSON. Back to the issue of 2 picocuries.

Mr. DIRCKS. What we tried to do is use again the principle of radiation control and achieve it, if you can, at a reasonable cost, based on the general principle we have operated under that.

If you can prevent it, don't allow additional radiation exposure.

Senator SIMPSON. I will furnish some other written questions, but in estimating the health effects, you indicate in yovr environmental impact statement that your estimates really assume the failure of all types of institutional control, nothing left, that in effect someone will come in and build a house right smack on top of the mill tailings disposal site. It is indeed a worst case scenario, as we refer to that in the Clean Air Act, in other areas of nuclear it is the ultimate horror story aspect or scenario.

Is that a reasonable assumption for any kind of regulation when you consider this fact alone that the Federal Government is going to own the site and the NRC has an annual inspection role?

Mr. DIRCKS. I think the way it was phrased, it is not an accurate assumption. We had not assumed that houses would be built on tailings piles.

Senator SIMPSON. That is in effect what the failure of all institutional controls would mean.

Mr. DIRCKS. But we have in the regulations required that the site, as you mentioned, be turned over to a governmental entity, Federal or State.

We hope that the site will be free from activities, that is why we want the governmental control there. We don't want to maintain a monitoring network around the site in perpetuity and we don't want governmental entities trying to maintain the cover onsite. That is basically why we recommended the 3-meter cover to eliminate the need for perpetual maintenance.

Senator SIMPSON. I do not like to pull the old sharpshooter game, although I lived it when I practiced law, but your own generic environmental impact statement, on pages 12 and 13 in the appendix says, "The land use scenario evaluated here is a conservative one, it involves occupancy of the structure directly over the tailings."

Mr. DIRCKS. I know that example, it has been referred to several times. Could I ask Mr. Martin, who participated in the writing of the statement, to respond?

Mr. MARTIN. That three-volume document examined a multitude of different perspectives to give the reader some kind of perspective of the full range of things that might happen and if they did what would be the effect. That was one of the more ridiculous things we looked at just for perspective so that if someone reading would say, if that happened, what would be the effect? But it is wrong to say that the standard is based on that. It is not based on that. It is one of the multitude of different perspectives that were presented to the reader to get a feel for what kind of problem this is.

Senator **Simpson**. I won't say whether your job is to scoop up the readers or to elucidate them; the point being that I would like you to furnish me a definition that you have in-house as to what it means when it says, "Failure of all institutional controls", and how, when the Federal Government is going to own the tract and when the NRC has an annual inspection mission, that those things are going to occur in that way, if you could.

[The information requested follows:]

NRC did not base its regulations on the assumption that government control of tailings sites will fail. Recognizing that tailings will be hazardous for thousands of years, though, NRC took the approach that obligations on the part of the government to perpetually maintain many tailings sites—i.e., to be constantly repairing eroded areas, repairing fences and so on—should be avoided. This, in fact, is the mandate given us by the Mill Tailings Act which states that the need for ongoing maintenance and monitoring of tailings sites should be minimized and, to the extent practicable, eliminated. We have determined that with thick earthen covers which are protected from erosion, the mandate can be met at reasonable cost.

While the primary means of isolating tailings should be such physical barriers, it also is prudent to supplement these with the land-use controls provided by government ownership of sites. Pursuant to the Tailing Act, NRC regulations call, in most cases, for transfer of land ownership to the government. And while the regulations don't assume failure of institutional controls, the inevitable uncertainty about their effectiveness over the very long term dictated that we analyze what risks would be associated with various intrusion scenarios. However, those scenarios, we point out again, were not the basis for setting limits in the regulation.

Senator **Domenici**. You mentioned something about 1 percent in your cost estimate. Would you not agree that there is a difference in cost of compliance and reasonableness with reference specifically to criteria 6. I will take the example of Kerr-McGee ongoing sites in New Mexico versus a number of others that you are negotiating with.

Mr. **Dircks**. I think what we want to emphasize when we talk about 1 percent is the cost of a new mill. The cost of dealing with active mills—mills that are operating over a number of years—yes, that would vary considerably.

Senator **Domenici**. So the 1 percent in your response to the chairman does not apply to the cost for an ongoing mill like the Kerr-McGee one in New Mexico?

Mr. **Dircks**. No. When I answered the chairman's question I noted that it was for newly licensed mills.

Senator **Domenici**. What do you estimate the cost would be if criteria 6 were applied to the kind that I just described, and if it were applied literally and without any room for flexibility?

Mr. **Dircks**. I will let Mr. Martin handle that.

Mr. **Martin**. I think we have to look and see how many years are left of mill operations and how many more tailings are going to be generated. The case at Kerr-McGee that you refer to, I do not really know the details but at the hearing down at New Mexico a week or so ago, I think they said they planned on operating that place until the 1990s sometime, which will give several years. So I would make a guess it might be, if you take it on that basis, in the order of maybe 3 percent of the product price, something like that. I don't think for these old piles it is going to be linear or it will not be in direct proportion to the number of tons produced. It would probably be more than 1 percent, probably less than 3.

Senator DOMENICI. What are they going to do about that pile if they have to have 10 meters of earth on it?

Mr. MARTIN. I don't think we know because I don't think anybody has seriously looked at that problem yet as we have in other States.

We don't know until that is grappled with for a year or so and there are some proposals put forth to stabilize them.

Senator DOMENICI. But your position is no different than Mr. Dircks' that NRC's present posture is that the State does not have to adopt that criteria literally in order to come up with a program and remain as an agreement State.

Mr. MARTIN. No, they have to adapt it to what they think they can live with and make a proposal and to date they have not done that, as far as I know.

Senator DOMENICI. Mr. Hernandez.

Mr. HERNANDEZ. Mr. Chairman, if I might, just to clarify an issue that Senator Domenici asked me a question on and I reread my testimony on that. I indicated actually whether or not I was in effect endorsing the notion NRC has adopted their own regulations at this time for active sites prior to the EPA's setting some kind of standards, and I purposely, what I did was a recitation of history and neither an endorsement of those standards themselves or those regulations themselves. I purposely stayed away from any comment on endorsing them.

Senator DOMENICI. So when you said they are proceeding you were giving history, you were not indicating pro or con whether this was an appropriate way to go without some basic standards set by EPA as required by law.

Mr. HERNANDEZ. That is correct.

Senator DOMENICI. Thank you, Mr. Chairman.

Senator SIMPSON. Thank you so much, Mr. Meyers and John Hernandez, and Mr. Dircks, thank you for your testimony.

The final panel, then, of the afternoon will be George B. Rice, vice president of the Kerr-McGee Corp., representing the American Mining Congress; Edward C. Gibbs, vice president and general manager—uranium, Rocky Mountain Energy Co.; William Paul Robinson, director, Southwest Research and Information Center; and Luke J. Danielson, Natural Resources Clinic, University of Colorado School of Law, representing the National Wildlife Federation.

Senator DOMENICI [presiding]. If you would please proceed.

STATEMENTS OF GEORGE B. RICE, VICE PRESIDENT, KERR-McGEE CORP., REPRESENTING THE AMERICAN MINING CONGRESS; EDWARD C. GIBBS, VICE PRESIDENT AND GENERAL MANAGER—URANIUM, ROCKY MOUNTAIN ENERGY CO.; PAUL ROBINSON, DIRECTOR, SOUTHWEST RESEARCH INFORMATION CENTER; AND LUKE J. DANIELSON, NATURAL RESOURCE CLINIC, UNIVERSITY OF COLORADO SCHOOL OF LAW, REPRESENTING THE NATIONAL WILDLIFE FEDERATION

Mr. RICE. Mr. Chairman, today I appear on behalf of the American Mining Congress, as chairman of its uranium environmental subcommittee.

The AMC is a trade association of over 600 members, which include the producers of a large proportion of the Nation's uranium.

AMC has submitted a written statement that details our concerns with recent regulatory efforts of the EPA and the NRC that are the subject of these hearings. Because our time is limited, I will testify on only one of these regulatory efforts—NRC's uranium mill licensing requirements which impose a host of very stringent new requirements on the uranium mill industry. The NRC has recently informed the Department of Energy that these same requirements will also be applied to that Department's disposal of mill tailings at inactive mill sites.

We understand the need for health, safety and environmental regulations applicable to nuclear fuel cycle operations, including uranium mills. However, such rules should reflect the actual risk to the public. We do not believe that NRC's requirements are rational or justified under the circumstances.

First, NRC bases its estimates on unproven hypothetical risks which the agency admits may be zero.

Second, the costs resulting from NRC's requirements far outweigh any possible benefits they may yield.

According to the NRC, the primary source of potential radiation exposure to the public, both during and after milling operations, is radon. Radon is a naturally occurring inert gas that is emitted in variable quantities from numerous sources, including soil, rocks, water, and building materials—such as those used to construct this building. Radon from mill tailings is a tiny fraction—far less than 1 percent—of these natural sources of radon.

Even if uranium milling were totally eliminated, the resulting reduction of radon in the environment would be insignificant and undetectable. Indeed, we are unaware of elevated levels of radon ever having been detected more than about one-half mile from a tailings pile.

No studies show that radon at the low levels associated with tailings will actually hurt anyone. Even NRC admits the hypothetical risk of cancer from radon is negligible. The agency has explained that it is less than 1 in 70,000,000 per year for 3 times the number of mills now in existence. This is a miniscule level of risk compared to other risks we all commonly accept. It is roughly equivalent to the risk from driving a few blocks in a car or from taking a few puffs on a cigarette. In fact, the agency has admitted that the public generally accepts risks far greater than those posed by tailings.

We believe NRC has overstated the risk from mill tailings. A group of experts, including representatives from EPA, The Department of Energy, and Britain, Canada, and Germany, recently published a study indicating that the maximum risk per unit of exposure to radon is less than one-third that projected by NRC and may be zero.

To reduce these hypothetical risks, NRC regulations provide that the mill operator cover the tailings with a minimum of 10 feet of earth and that the tailings pile be guaranteed to be maintenance-free until the year 3,000. This will cost both industry and the Government a tremendous amount. We understand that the Department of Energy now estimates that the cost to the taxpayers to comply with stringent standards of this nature will exceed a half billion dollars, just for cleaning up the inactive millsites. We estimate that the cost for the uranium milling industry to comply will be over $1 billion. We believe that a recent report by the House Armed Services Committee aptly characterizes the possible expenditures; particularly if analogous standards are extended to other nuclear facilities and the Defense Department:

> The cost to the taxpayer could be in the tens of billions of dollars, an expenditure that could, after appropriate evaluation, prove to be unnecessary.

Congress in the Mill Tailings Act directed that "reasonable" efforts be made to minimize the risks posed by mill tailings. In view of the minimal risks and excessive costs, NRC's regulations are unreasonable and hence fail to comply with the act. In addition, NRC's regulations violate at least two other requirements of that act.

First, because EPA has not issued general standards for active uranium processing sites, NRC's regulations are premature. Section 206 of the Mill Tailings Act directs that EPA must promulgate general standards for the protection of the public health, safety, and the environment and that NRC is then to implement these standards. Under the provisions of the Mill Tailings Act, NRC's standards and attendent criteria for the management of mill tailings must await EPA's general standards.

Second, NRC's actions render meaningless the provisions of the Mill Tailings Act on State participation in the regulation of uranium milling. NRC has recently informed all agreement States that they must adopt all of NRC's regulations or their agreements will automatically terminate in November of this year.

Senator DOMENICI. How do you square that with what you just told us?

Mr. RICE. The representatives here today appeared to agree that NRC does not require States to adopt all of these regulations. But NRC took the exact opposite position in a letter to Governor King and others, and also NRC recently told the Tenth Circuit Court of Appeals in Denver, "It is unreasonable to interrupt UMTRCA to authorize the States independently to determine the extent to which their implementation of NRC's requirements will be practicable."

Senator DOMENICI. Is Mr. Dircks still here?

[No response.]

Senator DOMENICI. I don't think the chairman would object if we had the committee communicate to him and to the subcommittee copies of letters interpreting this section to the Governor of the State of New Mexico, and any other communications with reference to the particular issue—submit them to the committee for the committee's perusal, if you will do that, and ask them to submit it within the next 5 days. We got a bill on the floor waiting for this hearing.

Mr. Rice. Senator Domenici, we could provide the transcript of the material from the court of appeals and the record, letters.

Senator Domenici. I think that will be good. Could you submit that? (See p. 191.)

Is it the national that is litigating or regional? Who is in court with you?

Mr. Rice. It is the NRC here in Washington.

Senator Domenici. When you submit that, would you also submit it to NRC if they have any comments with reference to what you have submitted to get their version of the submittals?

Mr. Rice. Yes.

Senator Domenici. Please proceed.

Mr. Rice. Under the statute, agreement States need not adopt Federal requirements they find "impracticable." NRC effectively voids this statutory right of agreement States by claiming that the Commission's regulations are everywhere practicable and therefore that they must be adopted in total. Moreover, NRC's pressure on agreement States effectively voids the provisions in the Mill Tailings Act for State proceedings on uranium mill requirements. States simply cannot hold meaningful hearings and reach considered decisions in the time demanded by NRC. NRC's position is especially anomalous considering that the agency itself took 5 years to devise these requirements. NRC should not be permitted to run roughshod over the statutory scheme.

In conclusion, we emphasize that NRC's regulations cannot be justified on a cost-risk-benefit basis. In contrast to NRC's requirements, EPA's standards will likely be established on such a basis in view of the requirements of Executive Order 12291. Without relief, our members may be forced to comply, at great cost, with the NRC regulations that will soon have to be changed to conform to the EPA standards. To avoid this irrational result, Congress should reaffirm its earlier intent that EPA should first issue standards. In the meantime, enforcement of NRC's regulations should be suspended until after EPA has issued its standards and until NRC has conformed its regulations to those standards.

We also suggest that Congress provide agreement States at least 2 additional years in which to adopt requirements conforming to final NRC regulations to the extent practicable. To assure equality of treatment for companies operating in non-agreement States, the effective date of Federal requirements should conform with the effective date of regulations in agreement States. We believe action by Congress is advisable to assure that a lawful, workable set of requirements is devised to address the concerns posed by uranium milling. NRC's current regulations are much too extreme. They are unsupported, unreasonable, unduly costly, and, therefore, contrary to the public interest.

Thank you for this opportunity to outline our views. I would be happy to respond to any questions or requests for additional information.

Senator DOMENICI. Go ahead, you are next.

STATEMENT OF EDWARD C. GIBBS

Mr. GIBBS. Mr. Chairman and members of the Nuclear Regulation Subcommittee, my name is Ed Gibbs and I am vice president and general manager of uranium for Rocky Mountain Energy Co. With me today is Dr. Lyda W. Hersloff, environmental specialist for Rocky Mountain Energy. We are very pleased to have this opportunity to present our views concerning Federal uranium policies that affect the viability of the domestic uranium industry.

Rocky Mountain Energy is the Denver-based subsidiary of the Union Pacific Corp. RME is responsible for developing the corporation's coal, uranium, trona, and other mineral resources. As part of a joint venture with Mono Power Co., a subsidiary of the Southern California Edison Co., RME currently operates the Bear Creek Uranium Co. in the southern Powder River basin in Wyoming. In addition to other energy projects, RME is conducting in situ leach research and development, and uranium exploration operations throughout the United States.

We have prepared a written statement that expresses Rocky Mountain Energy's concerns on the recent regulatory efforts of the EPA and NRC. This statement has been submitted to the subcommittee. We would be pleased to answer any questions regarding our prepared statement. My oral comments today will be a summary of that statement and will focus on: NRC's mill tailings licensing criteria; EPA's uranium standards; and Federal uranium policies affecting the viability of the domestic uranium industry.

Before I address specific uranium issues pertaining to the Uranium Mill Tailings Radiation Control Act of 1978, I would like to commend you, Mr. Chairman, and other members of the subcommittee for your efforts to resolve NRC reactor licensing issues. It is important that the NRC be authorized to issue without public hearings, license amendments that do not involve significant hazards considerations. In addition, it is important that the NRC be authorized to issue interim power operating licenses. These two actions will reduce the amount of time needed to license nuclear plants, yet will not interfere with protecting the public health and safety. Domestic uranium producers clearly recognize that delays in reactor operations which result from NRC license processes can significantly affect the viability of the domestic uranium industry. RME encourages you and other members of the subcommittee to continue your efforts to resolve these issues.

I would also like to give you a brief background on our Bear Creek Mill since this is one of the newest uranium operations, licensed under NEPA and employing some of the latest radiation control techniques and practices.

The Bear Creek Uranium Mine was discovered by RME geologists in 1967. Environmental studies were begun in early 1974 and data was collected on vegetation, wildlife, water and air quality, archaelogy, climate, topography, soils, and historical values. Socioeconomic research included surveys on the availability of housing, educational, medical, and recreational facilities in the area. This detailed information was used in the planning of the Bear Creek project and also became part of the draft environmental impact statement prepared by the U.S. Nuclear Regulatory Commission, the U.S. Forest Service, and the U.S. Geological Survey. Following a series of public meetings to review the statement and receive comments on the project, a final comprehensive environmental impact statement was published in June 1977.

An extensive environmental program was designed for Bear Creek. Tailings management, monitoring programs, and reclamation efforts have received considerable attention by RME so that the utmost care would be provided to protect the environment and the public health and safety. Through our team of experts, we are committed to maintain this level of concern to protect the poblic health and safety while at the same time providing valuable energy resources to meet U.S. energy needs.

I would like to emphasize that RME is not opposed to all Federal and State regulations affecting our operations.

In fact, we fully support reasonable regulations that are appropriately designed to protect the public health and safety. Additionally, we welcome the opportunity to work with Federal agencies to develop regulations that specifically address and resolve actual problems. Our problems, however, stem from the fact that some regulations and Federal policies, while having the goal of protecting the public health and safety, do not actually accomplish this goal in relation to the costs required.

At this time, I would like to focus my comments on specific NRC regulations promulgated pursuant to the Uranium Mill Tailings Radiation Control Act. In addition, I would like to address EPA authority to set standards for uranium milling and mill tailings operations.

Pursuant to the authority vested in the NRC by the Uranium Mill Tailings Radiation Control Act, NRC promulgated mill tailings license requirements in final form in 1980. Rocky Mountain Energy participated during congressional consideration of the Mill Tailings Act and generally agreed with the purpose behind that legislation. During congressional consideration of that legislation, it became clear that one of the primary goals was to minimize the need for maintenance and monitoring of uranium tailings operations. At that time, it did not seem the intent of Congress to authorize the NRC to specifically and in detail tell uranium companies how to operate every aspect of a uranium tailings operation. We feel this distinction is very important.

The final NRC tailings regulations, however, address in detail the specific methods to accomplish goals relating to siting, operation, decontamination, decommissioning and reclamation of mills and tailings or wastes systems. The details of our specific problems with the criteria are set forth in our prepared statement which has been submitted to the committee. We would like to emphasize at this time, that while we support the objectives of the NRC licensing criteria, that we believe the criteria should not address specific methods to accomplish the goals. We strongly believe that the regulations should provide the discretion for individual uranium companies to establish the means to accomplish the goals of minimizing the need for long-term maintenance and monitoring.

We commented in detail to the NRC during the promulgation of the regulations that the criteria should not address specific methods to accomplish the States goals. Unfortunately, our comments as well as many others, were not incorporated into the final regulations.

Additionally, the NRC regulations are untimely because they are based on standards not yet promulgated by the EPA. Consequently, there is every reason to believe that the NRC regulations will have to be revised subsequent to EPA action setting standards for active tailings piles.

We strongly recommend, therefore, that the NRC regulations be suspended until the EPA sets its standards for active sites, and that the NRC should reconsider the specific nature of the mill tailings criteria so that the economic impact can be reduced while at the same time providing for the public health and safety.

EPA standards setting limits on radiation exposure to any member of the public from milling operations have also received substantial consideration from uranium producers. The 25 millirem standard set by the EPA represents a 95-percent reduction from the previous limit.

It may be of interest to relate the new EPA standard to everyday occurrences in order to indicate the extreme nature of the new standard. We are now required, according to the new EPA limit, to insure that any exposure of radiation from our uranium operations be lower than the equivalent of, for instance, eight round trip air flights between Denver and Washington, D.C., or the difference in cosmic radiation resulting from a move from the east coast to Denver, Colo.

While we are not adverse to setting regulations that actually protect the public from unnecessary releases of radiation, we strongly recommend that the standards set by the EPA be reasonable, based on appropriate analytical data, and of course, have a fair balance between the costs and benefits to the public.

The 25-millirem standard set by the EPA will be particularly difficult to monitor at our uranium operations in Wyoming because in many instances the natural background radiation in the area exceeds this level. It will, therefore, be difficult and very costly to demonstrate compliance with this standard. In fact, EPA has estimated that for the average mill, the cost will be approximately from about $290,000 to $860,000 in 1976 dollars—this compares to an estimated cost of $864,000 to $1,814,000 in 1980 dollars. It is interesting to note that the NRC at hearings in 1976 echoed this fact and warned of the problems in setting such a low standard.

One of the most obvious results of EPA setting these standards is an increase in the cost of yellowcake production, making it increasingly difficult for domestic producers to be viable contenders in the marketplace.

Again, RME does not oppose the promulgation of reasonable standards which will protect the public and provide for long-term maintenance of tailings piles. We stress, however, that these standards should be set reasonably so that uranium producers are not forced into losing operations merely because of some unreasonable standards set by the Government. We would be pleased to work again with the EPA to reconsider the 25-millirem standard. In addition, we specifically encourage this subcommittee to consider appropriate action requiring the EPA to reconsider the 25-millirem standard.

I would now like to comment on the issue of the viability of the domestic uranium industry.

The critical state of the domestic uranium industry necessitates revision of Federal uranium regulations and policies which affect the viability of the domestic uranium industry. The need for immediate Federal action addressing the current plight of the domestic uranium industry is readily apparent when one reviews the existing and projected state of that industry:

Domestic uranium exploration activity has been reduced and is not expected to increase in the near future.

There is increased interest by domestic uranium companies to participate in foreign uranium production.

Future uranium production is uncertain as a result of substantially increased domestic production costs, depressed uranium prices, and uncertain development of nuclear power in the United States.

Uranium demand has slipped dramatically since the early 1970's. For example, in 1974 the Government forecast 102 gigawatts nuclear capacity would exist by 1980, yet in that year only 53 gigawatts was in operation; projections for nuclear capacity in 2000 have slipped five-fold from 1974 forecasts.

Approximately 4,000 uranium workers have been laid off over the past 18 months. In Wyoming alone, there has been a 36-percent decrease in uranium production employment since May 31, 1980.

At least 15 of 55 U.S. utilities have contracted for foreign uranium. In addition, new long-term foreign supply contracts are presently being negotiated by domestic utilities.

Foreign uranium resources are substantial and have been growing. In addition, foreign uranium comes from comparatively low-cost production centers.

Existing Federal uranium policies are encouraging the use of foreign uranium which will result in unnecessary and costly dependence on foreign energy resources.

The maintenance of a viable U.S. energy industry is essential to meet U.S. energy needs. The Joint Committee on Atomic Energy in 1964 recognized this fact and amended the Atomic Energy Act of 1954 to require the maintenance of a viable domestic uranium industry.

Section 161(v) of the Atomic Energy Act of 1954 provides: "To the extent necessary to assure the maintenance of a viable domestic uranium industry," the Department of Energy "shall not offer services for source or special nuclear materials of foreign origin intended for use in a utilization facility within" the United States.

Senator SIMPSON [presiding]. If you would summarize now, your 10 minutes has expired.

Mr. GIBBS. First, existing Federal uranium regulations, leave little room for domestic uranium producers to design alternative methods to meet health standards at reasonable costs. We need to look at EPA standards and NRC regulations.

The existing Federal uranium enrichment criteria which promote the increased use of foreign uranium for domestic end use should be reevaluated by the Government and amended to limit the amount of foreign uranium used in the United States.

Thank you.

Senator DOMENICI. Mr. Chairman, in your absence, there is obviously a rather serious conflict between the testimony of Mr. Rice, who testified first on behalf of the American Mining Congress, and what Mr. William J. Dircks told us the position of NRC was with reference to agreement States having flexibility to depart from the criteria document.

So, in your absence, I asked that staff contact NRC and obtain communications to Governors, including ours, with reference to that issue, and that the witness submit excerpts from the court record of NRC's position in the pending litigation wherein he indicates a contrary position was taken from that that Mr. Dircks told us. Subsequent to the submission of those excerpts, I asked that staff get NRC to look at those excerpts in the event they had any additional clarification from the court record on that issue.

Senator SIMPSON. That is very important. I appreciate that.

Senator DOMENICI. Thank you, Mr. Chairman.

Senator SIMPSON. Now we have Paul Robinson.

STATEMENT OF PAUL ROBINSON

Mr. ROBINSON. Thank you, Mr. Chairman, Senator Domenici, I appreciate the opportunity to appear before you. My name is Paul Robinson, I am the director of the Southwest Research and Information Center. That is a public interest research organization active in water-and-mining issues in New Mexico and the West for the last 5 years.

I have submitted a written testimony to the subcommittee on these issues that included the lengthy appendices which includes previous comments I have made on agreement States issues before the House Interior Committee and our amicus brief in the industrial challenge issue which has been the subject of some discussion today.

Let me start by saying that these standards which we are discussing today I believe are technically practicable. One can make that statement, I believe, with a great deal of confidence based upon recent licensing experience of the agreement States and the NRC.

In the last 3 years the NRC has renewed the licenses of eight, eight active tailings piles totaling 50 million tons of tailings in Utah and Wyoming. Colorado, as Mr. Hazle has said, has recently renewed the license of the Cotter facilities and is about to renew the license for the Uravan project.

So, from a technical practicability standpoint, I believe industry's pursuit of licence and agreement to license position is one way to demonstrate this performance.

With respect to economic practicability, I think with the price of uranium down 40 to 50 percent over the last year, there are a number of things which are not economic practicability with the industry and to try to locate that economic problem on these tailings rules, which were drafted in October 1980, considerably after this price drop began, I think is a misplaced allegation.

In addition, one can talk about this 2-picocurie 3 meter concern which Senator Domenici has addressed. One, I think, needs to note in New Mexico that the most recently licensed mill in the State, the Gulf facility, which has no uranium contracts as of this time, is proposing to cover its tailings with 50 feet of rock cover. This facility is not in operation as yet. We are going below the picocurie tailings pile and they are digging a pit and covering it.

We also have major operations in New Mexico, both United Nuclear and Kerr-McGee, who are presently backfilling large fractions of their tailings in the ground, one 2,000 feet below the surface, clearly meets this 3-meter criteria with a great deal to spare. These backfill operations have been approved by the New Mexico licensing authorities.

With respect to New Mexico's performance and its ability to implement these rules, I believe the presentation by Mr. Clayton before you is several times longer than New Mexico's presentation before its improvement board concerning these rules. The New Mexico rules were almost directly copied from the NRC rules and only proposed for hearing by the EI about 6 months after the original rules were written by the NRC. Though the State received a $133,000 grant, they appeared to not have used it to apply these rules to the New Mexico setting. We have no written analyses of the practicability of specifics or general rules in the State prepared by New Mexico's regulatory agencies.

I believe this is the type of analyses which one would want to see if you were going to make an allegation that rules were practicable or not.

With respect to these costs from the industry standpoint, at the New Mexico Radiation Technical Council meeting of May 1981, a representative of Kerr-McGee said it would cost $21 million to stabilize the company's projected 60-million-ton pile, in the 1995 period, $85 million for 60-million tons. The DOE witnesses said it was going to cost over $450 million for a smaller volume of tailings under the inactive program.

So, I believe when one talks to the operators, one would have to have cost estimates and these cost estimates are considerably cheaper than those being developed by the regulatory bodies.

Companies are very good at innovating low-cost options and I think the rules allow this form of innovation.

When one looks at specific criteria, I think that the flexibility that the subcommittee and the operators are looking for exist. If one takes this criteria, the 3 meter, 2-picocurie limit, one finds at the body of that section an out clause which allows lesser levels of cover to be used if a demonstration of similar long-term erosion is low. These clauses exist with the ground cover criteria specified in the NRC rules which have been adopted almost without change by New Mexico's proposed language.

With respect to the Senator's question, should the 2-year extension be offered, I believe that that would not be an appropriate response. New Mexico, as with other agreement States, still have time to meet this No. 8 deadline. The State has not tried to defend these rules at hearing, has not tried to develop the practicability issues in writing for New Mexico and I think that from that standpoint they have not tried hard to implement these rules. Nevertheless, we still have an opportunity in the next 5 months to further develop these rules.

If one is going to give the States 2 more years, they will use it all. One should not be surprised if they come back and ask for 2 more years. The State has had ample opportunity to adopt these rules. If they are not going to revise them and let the NRC defend these rules before a State regulatory body. This was the case in New Mexico just last week. I think this is a less-than-advantageous position to ask for a delay after a significant amount of work.

As a final point, let me say that the EPA in its inactive standards has also proposed a 2-picocurie limit. And this limit applies as an excess from tailings. It is not requiring tailings to be stabilized to 2 picocuries. It is 2-picocuries above existing background. So, it is not requiring companies to meet that.

I have mentioned a number of points quite quickly, and I appreciate the opportunity to comment before the subcommittee and would be glad to address any questions you may have.

Senator SIMPSON. Thank you very much. I appreciate your recognition of the time.

Now, Luke J. Danielson, please.

STATEMENT OF LUKE DANIELSON

Mr. DANIELSON. Thank you, Mr. Chairman. I have submitted also a written statement and with your permission I will simply hit what I think are the high points orally here.

I would say I am here representing the National Wildlife Federation, but I also do want to note that this is an issue of some personal concern to me since I spent much of my life living in the vicinity of two inactive tailings piles, one of which is eligible for remedial action under one, that at Durango.

I would like to make a few points to the subcommittee. The first is that I think that everyone here, particularly the witness from DOE, has conceded that the worst risk involved with the remedial action of the program is the people living in the tailings contaminated structures. That is the worst risk we have.

I am quite concerned, therefore, to find that DOE has designated so few properties or so few of these vicinity properties for remedial action to date. We have had some designations in the Canonsburg and Salt Lake City areas, but as you heard Mr. Hazle say, there may be as many as 7,000 of these properties, schools, houses, churches, workplaces in Colorado alone where remedial action may be necessary and yet there has been no DOE designation despite the fact we have had some fairly elaborate survey work dating back to EPA work dating back to 1971 which surveyed thousands of sites in these areas and we should have a pretty good handle where they are.

And I believe this subcommittee should inquire of DOE why most of these properties have not been designated.

With respect to one other issue, I would mention also that this committee should be aware of the concern expressed when this act was passed with respect to potential radiation releases from mining. The direction specifically given in the statute to EPA was to prepare within 1 year a report on the potential radicactive hazards of uranium mine wastes. That deadline is among the many deadlines which have not been made and I believe that report is something that is important as we consider this potential problem of the mines and that that report should be forthcoming as soon as possible.

I was among the reviewers of the draft of that report in September of 1979. At that time there was a very lengthy draft report that was circulated to dozens of people of all perspectives for comment, and none of us have any idea what has happened to that report since that time.

With respect to the extension issue. I would like to say we need to decide exactly what we are doing. If the problem is that we don't like the standards and that we think the standards are inappropriate, I don't think there is any need for an extension of time. If the problem is that the standards are generally acceptable to the Congress but we simply need more time, that is an entirely different issue.

What I am saying, a delay of the implementation is not an answer to concern over the specific content of the standards. Those are two separate issues that we should keep separate.

Senator DOMENICI. Let me ask you on that. I would generally tend to agree, but I wonder if that does not ignore the relevancy of EPA setting some?

Mr. DANIELSON. Well, I agree that it would be better had EPA done that. However, NRC does have to issue licenses. Nobody has proposed that NRC stop issuing licenses or renewing licenses until EPA acts. As long as NRC has to issue some licenses, I think it is far better that they have some criteria that applicants can look at. And if they are going to have this criteria, I think that for competitive reasons alone it ought to be better to require that the same standards be met in the agreement States.

So, I would suggest that we do need some kind of standards. We can't simply leave licensees and the public and the NRC in a vacuum pending EPA action, which optimistically is 2 years away.

Senator DOMENICI. There would be a little leeway on existing ones?

Mr. DANIELSON. With respect to mills that are already in existence?

Senator DOMENICI. Yes.

Mr. DANIELSON. I am not sure I understand.

Senator DOMENICI. If we found that it was important for EPA to have promulgated their standards, it would seem that there wouldn't be any need to issue licenses to existing facilities in the interim while we waited for EPA's findings. For new ones I understand, and for renewals, but renewals don't occur at short time intervals.

Mr. DANIELSON. Senator, that is one of greatest concern, the fact that as time has gone by our knowledge about this problem has increased and our concern about it has also increased. It was not that long ago, perhaps 15 years ago, that tailings were still being given away free to the public for use in filters, that they were being used around houses, that they were being used in highway construction, and in that 15 years we have learned a lot.

What concerns me is that the way the law works, once you have a license, if you apply for renewal before it expires, you can continue to operate without any deadline on the renewal. Frankly, that is our strongest concern about the New Mexico program, that many of these licensees—their licenses have expired 5, 6, 7 years ago; they applied for renewals and they have not been renewed. And one of the reasons is not that they can't meet the NRC standards, but that they can't even meet the standards New Mexico had inplace before these new NRC rules were ever adopted. And our concern is simply that New Mexico is facing a very difficult problem. It has got mills which may have met the standards that were in effect 10 or 12 years ago, but which can't meet the New Mexico standards of 2 or 3 years ago, let alone the new NRC standards. And the question is, What are we going to do with those mills? I don't think the NRC rules is what has provoked that problem. The deadline of the act has forced New Mexico to try to grapple with that problem and they have been in no hurry to do so because, as you know, it is a very difficult job.

When the existing law simply allows endless delay and you are faced with a thorny problem, that is the course of least resistance, simply not to renew these licenses and days of endless agonizing over it.

NRC rules aside, that problem has to be faced.

Congress told NRC in the statute itself that long-term maintenance and monitoring of these facilities should be reduced or eliminated to the maximum extent possible. We don't think that is necessarily what NRC has done. Frankly, you are talking about a period of time that is so great that it is impossible to comprehend when you are really talking about long-term maintenance and monitoring. NRC is used to figuring 100,000 years. The House Committee Report on this act gives us a figure of 1 billion years, which is a year far beyond my comprehension. That would take us back before Rome, before writing, probably before human speech if we took it the other direction.

So, when we are talking about standards, we are not talking about something that has to be durable for the next 6 months. We are talking about an extensive period of time.

Let me address the 2 picocurie standard and the 3 meters. The reason that I think the 3-meter standard is a good one that should be enforced is that the 2 picocurie standard, or any other standard, 50 picocurie, 10 picocurie, could be met by various interim measures which could quickly decay. You could cover tailings with a thick sheet of plastic and it would reduce the radon escalation very quickly. But the sheet of plastic is not going to be around for 10 years, let alone the kind of time periods we are talking about. So, whether 2 picocuries or 50 picocuries is the correct standard, we need to be talking about a durable mechanism—the 3 meter, is that durable mechanism.

The 2-picocurie standard, frankly I will admit that I don't know what the appropriate health risk estimators are and I don't think that anyone else knows. And I think a review of the scientific literature will show scientists agree.

So when we see somebody saying it is the same as two puffs of a cigarette, he can find one scientist to tell you it is the same as two puffs of a cigarette, yet in fact we have other scientists, equally reputable, who will take a different position.

We also need to recognize we are talking about a lot of other things beside fatal cancer. We are talking nonfatal cancer, we are talking about other diseases that can be caused by radiation, we are talking about toxic heavy metals and we are talking about the extreme economic injury that can occur to people like the farmers in the vicinity of the Cotter mill, downstream water users, and I believe we can also say to the general public.

It has been speculated, for example, that the rising heavy metal concentrations in Lake Powder, have much to do with uncontrolled seepage with tailings in the various tributaries in the Colorado River.

With that, I thank the committee and respond to any questions you may have.

Senator SIMPSON. Thank you very much.

Let me ask a question of the industry representatives. The NRC has elected to promulgate its regulations before promulgation by EPA of the final general environmental standards. If EPA were to publish a standard more lenient than the NRC is, how would that effect work already undertaken by the milling companies to comply with the more restrictive requirements and what would be the cost of complying with the new requirements once that work has begun?

Mr. RICE. That is a difficult question because one, in the agreement States we really have not implemented the NRC regulations, we are still working on them. Also, we don't know what the EPA may come out with.

But, certainly, those new mills that have recently been licensed anyway, they have not been built, some may be under construction now, and I would believe there would be a considerable expense that they may have gone to for nothing.

Senator SIMPSON. In your deliberations, as you come into this conflict with EPA and NRC, have you estimated the total cost of compliance with the NRC requirements or the health benefits that will accrue in the cost per health benefit of the compliance?

Mr. RICE. Sir, we have made a number of estimates that total cost will be well over $1 billion. The health effects calculations I do not have with me. Those have been made and are available.

So, we could show a cost-effectiveness report, if you would like that.

Senator SIMPSON. I think that would be helpful if you can—realizing that some of these are impossible proper response, but we are trying to get a sense of things.

How responsive are your cost estimates to the NRC's requirement that the radon emissions be limited to 2 picocuries if, for example, the NRC were to limit the radon emissions to 50 picocuries? Would that result in a substantial reduction in the cost of program for industry?

Mr. RICE. I believe right now that probably the controlling factor on the cost is the minimum of 3 meter cover or 10 feet of cover as opposed to directly whether it is 2 picocuries or 50 picocuries.

Mr. GIBBS. We have some numbers on independent uranium low operating cost to meet this radon limit, and it is estimated from $5 to $7 million per operator, but those were unescalated costs, but I am sure today they are considerably higher.

Our estimates are something like double that. And so, we are talking $10 to $20 million to meet that.

Senator SIMPSON. You have found that agreement States have provided an ample opportunity for public comment as we approach this November 8 date? And if not, how much additional time should be available to the States who might need to solicit or consider or respond to such comments?

Mr. RICE. In the State of New Mexico where our mill operates, the public comment—we just began last week with hearings and based on the fact those hearings went about 3 days—they were only planned for about 1½ days—and the record will remain open for several months—I would say that it is going to be quite a while before the State of New Mexico can get all the input and make judgments.

We have suggested that the agreement States have 2 years following promulgation of NRC regulations which conform with the EPA standards which have yet to come out.

Senator SIMPSON. Just a couple of other questions now.

Have you calculated the health benefits that would accrue as a result of the NRC's requirement of this 2 picocurie per square meter per second and are your calculations based upon exposure at the boundary of a site or have you assumed, as the NRC did, that an individual might actually locate on a mill tailings disposal site?

Mr. DANIELSON. I would say that our view is that it is very difficult to do this. And, frankly, as this article by Professor Land, that we have submitted to the subcommittee, anybody that claims to have a specific figure is misusing statistics. There is simply that much scientific uncertainty about how much health risk there is.

Now, the NRC figures say that somebody living in a ranch 2 kilometers downwind of the pile would have a 0.13 percent chance of increased chance of cancer, which it would mean if there were 10,000 people living there, you would have 13 additional cancer cases.

There are mills that are not so remote. In fact, one of the problems we have is that there is nothing in the law that puts a handle on development. So that might not be unrealistic in the future.

I would say one of the other problems is that the figures that are being attacked and defended here are simply the figures for fatal cancers and they don't talk about nonfatal cancers, they don't talk about other forms of diseases, they don't talk about birth defects. So, it is very hard without knowing the numbers of health effects from these other sources to say how many health effects we are avoiding unless we know what some of these other things are.

I would say it is a mistake to average this risk over all of the people in the United States and say it is very tiny or make that kind of global risk. We have to look at the people who live in the vicinity because they are faced with the highest risk, and those figures are substantially higher risk than some that have been given.

Senator SIMPSON. I think that is some of the more serious problems, that we get the horror stories from both sides. They used the figure they wanted to embellish the horror and we don't have the luxury of going over and voting maybe and we have to vote yes or no, and it is very perplexing.

I noticed in the Three Mile Island incident, the ranking minority member of this committee, under the leadership of Gary Hart when he was chairman, on the figures and how many deaths, tens of thousands—I don't know how anybody can judge that. There is nothing for me in that kind of stuff. Maybe there is for the wizards and the white papers.

I do want to get into the record a definition of a picocurie. That is a unit of measure in radiation. And I would hope it would appear at the beginning of hearing testimony because I think it is important for people reading it. It is a one-thousandth of a curie. And a curie is a unit of measure of the amount of radioactivity in a material whether it is retrofuel or uranium or mill tailings and 1 curie is equal to 37 billion disintegrations per second from the nuclei of atoms. And a picocurie is, therefore, a very small amount of radioactivity.

I wanted to get that somewhere in the tattered remnants of this case. Some sage might actually read the hearings and would want to know what one-thousandth of a curie is.

Senator DOMENICI. From what you read, would you know any more?

Senator SIMPSON. No; it just made me feel better to do it.

A final question and then I will defer to the Senator from New Mexico.

In light of the fact that radon emissions from mill tailings constitute less than 0.2 percent of natural background exposure and less than 0.005 percent of radon released from natural soils, is it reasonable to premise an entire regulatory program on the objective of running those sites to their natural condition?

Mr. ROBINSON. Mr. Chairman, I believe there were a number of responses to be made to that. I think it is appropriate to think of tailings in the area where they exist rather than tailings diluted in the whole continental United States which is what the statistics consider. We are only addressing tailings in this act. We are only talking about cleaning up the sites. We are not talking about cleaning up the other areas which are not used for uranium byproduct production.

In addition, these levels which may be quite diluted over the whole country are considerably higher if one thinks about a county scale or a 10- or 20-mile area around the tailings piles, and within those criteria the statistical percentage of radon released are considerably higher.

The other aspect of this is that the radon may be the most prominent health impacting factor discussed in tailings but it is by no means the sole.

If one limits radon, one is limiting a number of other things, and the concept of chosing a limiting parameter and addressing that in the rules and therefore reducing radium level, et cetera, is a commonly used regulatory mechanism, and that is the case we have now.

Senator SIMPSON. Senator Domenici.

Senator DOMENICI. Mr. Chairman, before I ask a few questions, I want to thank you for holding these hearings in light of all the other things that are going on in the Senate. I want to commend you for almost 4 hours of hearing which you were in attendance for almost all of the time.

First, I want to tell you I appreciate that. It turns out I think we have talked about some very important issues aside from those raised by my Governor asking that we consider an extension. I think there is some great basic issues that we have exposed here and I think they are appropriate for this kind of oversight.

Let me ask the representative of the American Mining Congress and Kerr-McGee, in reference to the Kerr-McGee plant in New Mexico, if the requirement found as item No. 6 that I have been referring to, reading the first paragraph of, 10 meters in the standard, if you had to comply with that, what would that do with that operation in New Mexico in your opinion?

If there was no flexibility, that was it, you had to comply, what would it do?

Mr. RICE. We would have to develop a source of about 10 million cubic yards of dirt to cover our ultimate pile and the most recent estimate that my people have put together and we have been told by the chairman of the Environmental Improvement Board in New Mexico, it is probably a low estimate because we left some things out. It is about $85 million.

Senator DOMENICI. For the committee's benefit, what would $85 million additional cost do in the market, as you see it now with that operation?

Mr. RICE. We have to begin coming up with cash. This would not be an economic thing to do considering the market.

As you know, most of the uranium producers are just getting by, if at all, right now.

Senator DOMENICI. Mr. Robinson, I have the impression from activities of yours in the State, and if I am wrong you correct me, but I have the impression you are antinuclear regardless of what you are testifying here. You are an antinuclear person. Is that a correct assessment?

Mr. ROBINSON. No, sir.

Senator DOMENICI. You are pronuclear?

Mr. ROBINSON. I am not in the nuclear business.

Senator DOMENICI. I wasn't talking about business. I know who you work for. It seems to me every time I read your name and your activity, that institute, that has been of an antinuclear nature. Perhaps I am wrong.

Mr. ROBINSON. I would say that is incorrect. I have, for example, recently been a consultant to the Atomic Industrial Forum trying to describe to them how to communicate with people in the area around their mill so that they can encourage faith. I am interested in people knowing about the mills in their area and don't try and get mills shut down, don't try to get reactors shut down. I don't think that is an appropriate or defensible strategy.

Senator DOMENICI. I don't believe that. I think if you are consulting with people on how to keep them open—it seems to me your primary business of late has been to figure out ways to close them.

Maybe you consult one way and act another. Perhaps, again, that is an unfair assessment on my part.

Let me talk about the flexibility or lack of flexibility in this NRC set of rules.

Are you a proponent that these be flexible or not?

Mr. **Robinson**. Yes, I am a proponent of flexibility in the rules and in the interpretation of the rules and stated as such before the New Mexico Environmental Improvement Board last week.

Senator **Domenici**. So you are on the side of the New Mexico board when it comes to any interpretation that says there can be no deviation from the 10-meter standard; is that correct?

Mr. **Robinson**. I understood the question to say that I would encourage no deviation from the 10-meter cover?

Senator **Domenici**. I said you are on the same side with the board in New Mexico seeking flexibility from that standard, yes or no.

Mr. **Robinson**. Yes, sir.

Senator **Domenici**. So you don't think New Mexico ought to have to have that and no deviation from it in order to be an agreement State; is that correct?

Mr. **Robinson**. Correct.

Senator **Domenici**. Did you so argue in your amicus brief?

Mr. **Danielson**. Senator, since I filed the amicus brief, I will answer that our argument is simply that there should be minimum national standards. Now, the minimum national standard can consist of a lot of other things. I wouldn't say that exactly 3 meters of earth cover should be a requirement in every single case. My concern is simply that if we don't put some kind of a floor under this—the Tailings Act specifically took the old compatability doctrine and put in this language and the House committee report uses the words "minimum national standards" I think in six different places that the House thought they were enacting minimum national standards scheme with the Tailings Act.

Senator **Domenici**. But if I understand one of the issues correctly, and I would appreciate it if you would answer specifically, New Mexico takes the position, as I understand it, that they would like to comply with minimum standards but over a plan that did not require the 10 meter and this standard, and they maintain that NRC has told them they cannot.

I am just asking you what your position is and what it was on that issue in the brief.

Mr. **Danielson**. My position, as it was in the brief, is that we do need a minimum national standard but that should not be expressed as a certain number of meters or feet or inches of cover. We need minimum national standard performance.

Now, as I said earlier, you could meet the radon emissions standard with a sheet of plastic, but it wouldn't last long enough to do it much good. So, if New Mexico could come up with a scheme for something other than 3 meters of earth cover, it would be durable, I would be in favor of it if they thought that is what they needed.

Senator **Domenici**. Mr. Robinson, let me ask you one further question. We put your statement in the record so we did not get to hear publicly your criticism of New Mexico's regulatory process on the board's staffing.

Is it fair to say that you do not think they are doing a very good job?

Mr. ROBINSON. New Mexico has failed to renew a single uranium mill license in the history of the agreement States program. I think there are severe and very important shortcomings that the committee should recognize whether you are considering New Mexico's program for compliance with pre-Tailings Act criteria or the current criteria.

I am an advocate of the agreement States program because it provides a local decisionmaker communicating with people. I think, however, if the program is not going to be performed under the State's renewal mill license program, it is not much of a program.

Senator DOMENICI. Are you actually in favor of the agreement States situation or do you favor the national Government doing it in lieu of the States?

Mr. ROBINSON. I prefer a New Mexico licensing authority and argued as such before the environmental improvement board. As a matter of fact, I was defending the specific rules that the State had proposed though their staff people were not.

Senator DOMENICI. Were you present when the board decided not to act?

Mr. ROBINSON. I was not present on Saturday, but the board commonly leaves a common period after the formal hearing is over for additional comments. So, it is a common practice in the State.

Senator DOMENICI. I take it you disagree with the Governor of the State that we need an extension; is that correct?

Mr. ROBINSON. Yes, sir.

Senator DONENICI. I have no further questions.

Senator SIMPSON. I have no further questions.

I want to thank you for attending and your testimony has been very helpful and informative and I appreciate it.

This will conclude the hearings today. Thank you so much.

[Whereupon, at 5:55 p.m., the subcommittee recessed, to reconvene subject to the call of the Chair.]

[Statements and other material supplied for the record follow:]

TESTIMONY OF
SHELDON MEYERS
DEPUTY ASSISTANT SECRETARY FOR

NUCLEAR WASTE MANAGEMENT
AND FUEL CYCLE PROGRAMS

U.S. DEPARTMENT OF ENERGY

TO
THE SUBCOMMITTEE ON NUCLEAR REGULATIONS

OF THE

SENATE COMMITTEE ON ENVIRONMENT
AND PUBLIC WORKS

JUNE 16, 1981

Mr. Chairman and Members of the Committee, I am pleased to participate in the Subcommittee Hearings on the status of the remedial action program established by Title I of the Uranium Mill Tailings Radiation Control Act of 1978 (P.L. 95-604). The responsibility for carrying out the program authorized by P.L. 95-604 is vested primarily in the Department of Energy (DOE), the Nuclear Regulatory Commission (NRC), and the Environmental Protection Agency (EPA). The Department has the lead responsibility for performing the required remedial action. NRC is required to concur in all plans for remedial action and to license all final disposal sites. The NRC will also be a cooperating agency with the DOE in the procedures required by the National Environmental Policy Act (NEPA). The EPA is required to promulgate general standards under which all cleanup, stabilization, and disposal activities are to be performed.

Within the Department of Energy responsibility for the Uranium Mill Tailings Remedial Action (UMTRA) Program is shared between the Offices of the Assistant Secretary for Nuclear Energy (ASNE) and the Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness (ASEP). A project staff under the Deputy Assistant Secretary for Nuclear Waste Management and Fuel Cycle Programs is responsible for the required remedial action. Responsibiity for the actual onsite implementation of the remedial action is in turn assigned to the UMTRA Project Office, which was established for this purpose within the Department's Albuquerque Operations Office. The Environmental Safety and Engineering Division of the Office of Environmental Compliance and Overview has responsibility for radiological survey and designation of properties and for certifying upon the completion of remedial action that a site meets the requirements of the EPA Standards. I will present information on the status of both parts of the program, and Dr. William Mott, Director of the Environmental Safety and Engineering Division, who is here with me today, will answer any questions that you may have on the ASEP portion of the program. I will also briefly address the status of those aspects of the NRC and EPA responsibilites which interface with current DOE project activities.

Requirements of the Act

Title I of the Act authorizes and directs DOE to:

-- Designate the processing sites and establish priorities for remedial actions,

-- Enter into cooperative agreemments with the affected states and tribes for the accomplishment of remedial actions at the sites,

-- Pay ninety percent of the remedial action costs, with the states to pay the remaining ten percent (with DOE to pay all costs for sites on Indian lands),

-- Perform the remedial actions using standards promulgated by the Environmental Protection Agency (EPA),

-- Seek and evaluate proposals for reprocessing of the tailings to extract valuable minerals,

-- Use technology in performing the remedial actions that will insure compliance with the EPA standards and assure safe and environmentally sound stabilization of the tailings,

- Obtain a license for the stabilized tailings repository sites from the Nuclear Regulatory Commission (NRC),

- Require the states to acquire disposal sites for tailings that must be moved from their present location, and

- Carry out the project with full public participation.

In addition to the specific requirements contained in Public Law 95-604, the "Uranium Mill Tailings Radiation Control Act of 1978," there are requirements in other Federal statutes such as the National Environmental Policy Act of 1969, as amended, which provisions also must be complied with by DOE in carrying out the project. The pace at which the project can be implemented will depend on the satisfactory completion of these requirements.

While not specifically spelled out in the mill tailings Act, the provisions of the National Environmental Policy Act (NEPA) apply to this project by virtue of the potential impact of the major Federal actions contemplated by Public Law 95-604 on the environment. Early in the process of establishing DOE responsibilities and organizing resources to implement the mill tailings Act, we decided that an Environmental Impact Statement (EIS) is required for any processing site where the tailings must be moved to a new disposal site since such action would constitute a major Federal action significantly affecting the environment. It was further decided that at any site where the tailings are to be stabilized in place an Environmental Assessment (EA) will be prepared to determine whether or not there is sufficient cause to prepare an EIS.

Progress in Implementation of the Act

Progress to date in implementing the Act has primarily involved site and vicinity property designation, radiological assessments, project definition, coordination and preparation of necessary agreements with states and tribes, scheduling and estimating, environmental activities, site acquisition, and technology development. In addition, the selection of major project contractors is well underway and remedial actions at vicinity properties have started. A summary of accomplishments and activities follows.

Designation of Processing Sites and Vicinity Properties for Remedial Action

On November 8, 1979, 25 inactive processing sites were designated for remedial action in accordance with the Act and priorities for performing remedial action were established with the advice of the Environmental Protection Agency.

The Act also provides for the designation of those properties in the vicinity of the 25 designated processing sites which contain residual radioactive materials derived from the sites. Currently, 51 properties in the vicinity of the Canonsburg, Pennsylvania, and Salt Lake City, Utah, and one high priority vicinity property near the Lowman, Idaho processing sites have been designated for remedial action.

Radiological Assessments

The radiological assessment program consists of aerial and mobile ground scan surveys, radon monitoring, and comprehensive ground radiological surveys of individual properties determined to be possibly contaminated by material derived from the site. Aerial radiological surveys have been conducted at all high priority processing sites and one medium priority site. An extensive radon monitoring program was initiated at Canonsburg, Pennsylvania during February 1980 and work is underway on a similar radon monitoring program for Salt Lake City, Utah. Comprehensive radiological ground surveys have been conducted on 126 additional vicinity properties near Canonsburg, Pennsylvania, which are currently under evaluation for possible designation for remedial action.

Remedial Action Certification

In addition to the above radiological assessments, independent surveys will be conducted during and upon completion of the remedial action. This in conjunction with other information will be used to establish the final certification of the remedial action. The initial plans for carrying out this procedure have been formulated.

Project Definition

The mission of the Uranium Mill Tailings Remedial Actions (UMTRA) Project Office is to plan, engineer, and accomplish the necessary remedial actions at all sites, in accordance with the requirements of the Act. During the first phase of Project Office operations, means for accomplishment of project requirements were defined.

A plan for accomplishing the project, in accordance with the provisions of the Act, has evolved out of this project definition phase. The process involves the acquisition of site information, determination of remedial action alternatives, compliance with NEPA requirements, detailed planning and engineering, performance of the remdial actions, and certification and licensing. Long-term maintenance and surveillance of the sites, owned by DOE, follows for an indefinite period.

State/Tribe Coordination:

One of the most significant accomplishments in this project to date has been the evolution of a process of consultation with the affected states and Indian tribes. Coordination with the affected states and Indian tribes actually began before enactment of Public Law 95-604. Immediately after passage of the Act, DOE coordination efforts were intensified, particularly in those states and for those tribes where high priority sites are located. The result of this coordination is an understanding with the states and tribes as to the requirements of the project and the relative responsibilities of the cooperating parties as defined in the Act. Of particular importance is the responsibility of the states to acquire processing sites, where required, and to select and acquire final disposal sites.

To date, cooperative agreements have been executed with the State of Utah and the Commonwealth of Pennsylvania for the sites at Salt Lake City and Canonsburg, respectively. A cooperative agreement with the State of Colorado for the Durango site is near completion and one for the Navajo site at Shiprock is in preparation. With these agreements in place, the remaining arrangements for the rest of the sites should follow with little difficulty.

Planning and Studies:

Project efforts in the area of planning and studies have concentrated on plans for the overall program and specific plans for technology development, NEPA activities, individual site data acquisition, health and safety considerations, quality assurance, public participation and information, and specific actions at high priority sites. Conceptual plans for remedial action projects at the first four high priority sites (Salt Lake City, Canonsburg, Durango, and Shiprock) have been drafted and are being used to coordinate with the states and tribes and with the NRC.

Other studies accomplished to date include technical and economic strategies for reprocessing of tailings, contractor acquisition strategy, radiological support requirements, methods for public participation, and techniques for transportation and disposal of tailings.

Scheduling and Estimating:

Preliminary schedules have been developed for each of the 25 sites based on certain assumptions regarding movement (or stabilization in place) of the tailings. The site schedules have been combined with schedules for other project tasks to produce an overall project schedule that shows all work being completed by September 1988. The present project schedule assumes that the EPA standards will be issued in final form by the end of this year, which under the terms of P.L. 95-604 is prerequisite to the performance of remedial action at the processing sites. Thus, the present schedule for the project reflects a completion date seven years from the date of the final EPA standards, as mandated by the Act.

An estimate of the total cost of the project has been developed. The estimate is based on estimates of costs for each site and group of vicinity properties, the costs for preparation and issuance of NEPA documents, the cost of the technology development effort, and the costs associated with planning and managing the project. The preliminary estimates for these costs are as follows:

Element	Estimate
Site Costs	$ 372,000,000
NEPA	10,000,000
Technology	18,000,000
Project Support	74,000,000
Total	$ 474,000,000

NEPA:

At this stage of the project, the focus is on data requirements to fulfill objectives and requirements of NEPA. Sandia National Laboratories has been assigned the task of preparation of all NEPA documents. Preparatory work on

EIS's for the first four high priority sites (Canonsburg, Salt Lake City, Durango, and Shiprock) has started. Public meetings to discuss the proposed scopes of the EIS for Canonsburg (including the Blairsville landfill site and the proposed Hanover Township disposal site) and Salt Lake City have been held. The first EA's for lower priority sites will be started later this year.

A project plan for implementation of NEPA activities has been drafted and coordinated with NRC. Publication of the plan will be completed in the near future.

Site Acquisition

Efforts to identify candidate disposal sites for the tailings at the first three high priority sites have been initiated by the states. These activities commenced at the request of DOE, pursuant to the provisions of the Act that require the states to acquire disposal sites. The identification of potential disposal sites for the Shiprock site (Navajo) is being accomplished by DOE with the assistance of Navajo officials.

Utah, Pennsylvania, and Colorado have identified candidate locations for disposal of the tailings from the Salt Lake City, Canonsburg, and Durango sites, respectively. The sites will be analyzed in the EIS's for these processing sites. The search for disposal sites for the remaining high priority sites will be started later this year.

The Commonwealth of Pennsylvania is also working on arrangements for the acquisition of the Canonsburg processing site, following a determination by

DOE that this acquisition is required for the purpose of performing remedial action at the site. An appraisal contracted for by the Commonwealth is scheduled to be completed by July 1981, and negotiations with the owner should begin shortly thereafter.

Reprocessing:

Activities have been initiated to obtain assay and metallurgical information on tailings at sites where there are indications that reprocessing of the tailings might produce income that would reduce the overall stabilization costs. Data has been gathered at the first two such sites, with the assay work scheduled to be completed later this year. The information will be used to calculate the amount of uranium that might be extracted from the tailings. At the present time, with the price of uranium significantly depressed, there appears little prospect that reprocessing of the tailings can be accomplished with a profit.

Vicinity Properties:

Work has started on Salt Lake City vicinity properties, using the interim EPA standards for structures and open lands published in April 1980. The cleanup of Canonsburg vicinity properties will begin this fall, with study and engineering tasks already underway. Activities at the first Salt Lake City location, Fire Station No. 1, were officially initiated on May 26, 1981, and are scheduled to be completed in October of this year. Engineering for additional Salt Lake City vicinity properties is now in preparation.

Contracting:

The procurement process leading to selection of the major project contractors has been started following the development of the scope of these assignments, the request for proposals, and other documentation required for the procurement process. The first competition, for the Technical Assistance Contractor (TAC), is entering the proposal evaluation phase, with the selection to be completed in early September of this year and award of the contract expected by the end of the year. The value of the TAC contract is expected to amount to about $65 million over a seven-year period.

Proposals are about to be requested for the second major contract, the Remedial Action Contractor (RAC). The RAC will be responsible for the design of the remedial actions at all twenty-five sites and for the performance of the work at the sites. The value of this contract is expected to amount to about $340 million over a seven-year period. Selection of the RAC should be completed by the end of this year, with award of the contract to be accomplished early next year.

Numerous other contractors and DOE national laboratories are already supporting the project. Sandia National Laboratories is responsible for all NEPA documentation and has been performing selected technical support tasks since January 1980. Technology development tasks are being performed by Oak Ridge National Laboratory, Battelle Pacific Northwest Laboratories, Lawrence Berkeley Laboratory, Los Alamos National Laboratory, and the University of Colorado. Radiological support, including the cataloging and analysis of data for the processing sites, is being provided by Argonne National

Laboratory. Interim engineering support for the Salt Lake City vicinity properties is being prepared by Ford, Bacon & David Utah, while National Lead of Ohio is responsible for engineering and remedial actions at the Canonsburg vicinity properties. Later this function will be performed by the TAC.

Technology Development:

The development of technology for removal, stabilization, and disposal of uranium mill tailings is an important part of th. project. Approximately $17 million has been budgeted for the development of tailings liners and covers, methods for conditioning and processing of tailings, hydrology and geochemistry, and information on basic tailings radiation phenomena and measurements.

The funds directed to the development of tailings stabilization technology are for efforts designed to obtain sufficient confidence that the EPA standards can be met and to develop more cost effect stabilization techniques. Work performed by the Battelle Pacific Northwest Laboratory on asphalt covers (and possibly liners also) has shown considerable promise. A large scale test of this and other techniques is scheduled to be conducted at the Grand Junction, Colorado processing site this summer. To date, approximately $6 million has been invested in technology.

Reporting:

As required by the Act Annual Status Reports on the UMTRA Program were submitted to the Congress in December of 1979 and 1980.

Status of NRC and EPA Activities

Under P.L. 95-604, several of the above activities require DOE to consult with or obtain the concurrence of the NRC. We have met with the NRC on a number of occasions and agreed upon documentation and procedures for implementing the required NRC involvement, including an agreement that the NRC will serve as a cooperating agency in the NEPA process.

From the regulatory standpoint the NRC has indicated that they do not intend to promulgate new uranium mill tailings regulations specifically for the UMTRA Program. Rather, the NRC will apply in the UMTRAP final disposal site licensing process the intent of the Technical Criteria and Long Term Site Surveillance Criteria in Appendix A of the existing NRC Uranium Mill Licensing Regulations published October 3, 1980.

To date the DOE/NRC interface is functioning well. The NRC has assigned specific staff responsibilities for the UMTRA Program and reviews are being conducted without undue delay.

Section 206 of P.L. 95-604 requires the EPA "to promulgate standards of general application ... for the protection of public health, safety and the environment from radiological and non-radiological hazards associated with the residual radioactive materials located at uranium mill tailings sites" eligible for cleanup under the Act.

On April 22, 1980, the EPA issued Interim and Proposed Cleanup Standards for Inactive Uranium Processing Sites for public review and comment. Proposed Disposal Standards for Inactive Uranium Processing Sites were issued on January 9, 1981. The closing date for comments on these standards has recently been extended from May 11, 1981 to June 26, 1981. DOE has provided comments to the EPA throughout the development of the standards, reflecting its position with respect to their implementation. DOE will also provide a formal statement on the proposed standards as a part of the public review process.

As I noted earlier, the UMTRA Project schedule which calls for the start of remedial action at the first high priority processing sites at the start of FY 1984 is dependent upon the EPA standards being promulgated by the end of CY 1981. If the standards are delayed beyond this point, the NEPA documentation for these sites will be held up and the start of remedial action will be delayed accordingly.

Summary

In summary, most of the prerequisite planning and organizational activities have been accomplished, and the project is ready to proceed with the NEPA activities for all the sites, to continue with processing and disposal site acquisition and to expand the cleanup effort on vicinity properties. As noted above the promulgation of the EPA standards is now on the critical path for the project.

TESTIMONY OF WILLIAM J. DIRCKS
EXECUTIVE DIRECTOR FOR OPERATIONS
UNITED STATES NUCLEAR REGULATORY COMMISSION

BEFORE

SUBCOMMITTEE ON NUCLEAR REGULATION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

JUNE 16, 1981

Mr. Chairman and Members of the Subcommittee, I am William Dircks, the Executive Director of the NRC. I am pleased to be here to discuss progress toward compliance with the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA).

I would like to start by reviewing the NRC activities to develop and apply regulations for the control and disposal of uranium mill tailings.

Regulatory Approach

In 1976, we started the preparation of a Generic Environmental Impact Statement on Uranium Milling Operations (GEIS) which evaluated alternatives for tailings control and disposal. Preparation of the GEIS involved extensive research, field measurements, and predictive model development. The GEIS was issued in draft form in early 1979 and was subject to both peer and public review including two public hearings in Denver and Albuquerque. After full consideration of public and industry comments, the GEIS was issued with appropriate changes in final form in October 1980.

The approach taken in preparing the GEIS and in developing associated regulations is based on the long-standing principles of radiation protection espoused by the International Committee on Radiation Protection (ICRP) and the National Committee on Radiation Protection (NCRP) and the Commission through its regulations such as 10 CFR Part 20 -- that radiation exposures to individuals be kept within appropriate limits and that exposures to radiation be reduced to as low as reasonably achievable--social and economic considerations taken into account. Application of these principles had to take into account the fact that mill tailings will remain radioactive for hundreds of thousands of years. There were two primary options: apply concentration or dose limits at a fenced boundary around disposal sites which are perpetually maintained by the government or provide isolation and containment of the tailings in a manner which avoids need for ongoing active maintenance or institutional control. We concluded that any solution which requires institutional controls to keep people away from tailings sites and to maintain the site for very long periods of time is not a complete solution. In view of the longevity of the hazards involved, it would be an uncertain and expensive one. Tailings disposal is better accomplished primarily by durable physical barriers, such as earthen covers which are protected from erosion, and which do not need indefinite long-term maintenance and monitoring. This is the approach taken in the NRC regulations.

We found that there are tailings disposal techniques which can be implemented at reasonable cost and which permit the return of disposal sites to conditions which are essentially the same as those of surrounding environs, without the need for continuing active maintenance.

In addition to being based upon the long-standing principles of radiation protection, the NRC approach is consistent with the specific mandate of UMTRCA that every reasonable effort is to be taken to stabilize tailings in a way that prevents or minimizes radiation emissions and other tailings hazards and, if practicable, do so in a way that eliminates long-term maintenance and monitoring.

Regulations

I would like now to review in a bit more detail the nature and content of our regulations. The regulations are written primarily in the form of performance objectives because the problem of tailings management is highly site specific and flexibility is needed. While cast primarily as performance objectives, the regulations specify numerical limits and minimum requirements where we are aware of problems needing levels of protection and in order to provide the degree of certainty necessary for an effective licensing process.

The regulations require:

- That thick earthen covers be placed over the tailings to assure long-term isolation and reduce radon emission to what we have determined to be as low as reasonably achievable (a radon flux limit of 2 $pCi/m^2/m^2$-sec and a 3-meter minimum cover thickness are required).

- That seepage control measures be adopted such as use of low permeability impoundment liners.

- That siting and design criteria be observed to reduce the potential for erosion and thus achieve long-term stability of the tailings containment.

- That financial arrangements be provided to assure that decommissioning and reclamation commitments are carried out.

- That funds be provided to cover the costs of long-term site surveillance.

Actual Application of Regulations

Since May of 1977, the staff has used criteria which are comparable to the now effective regulations in working out tailings management programs at five new mills within NRC's jurisdiction in Wyoming and Utah and five new mills in the Agreement States of Colorado and New Mexico. These ten new mills, which have been licensed or are in the latter stages of licensing, have established tailings management and reclamation programs which substantially comply with the NRC regulations.

Upgrading of active, ongoing operations where tailings piles already existed, proved more difficult than establishing a disposal plan for new mills. However, by applying licensing criteria to the maximum extent practicable on a case-by-case basis and through the conscientious and innovative efforts of the operators, upgraded tailings management and reclamation programs have been established for all existing mills within our jurisdiction in Wyoming and Utah. In addition, the Agreement States of Colorado and Washington have used NRC licensing criteria, with our technical assistance, to upgrade tailings management programs at existing mills within their states.

In summary, we have had extensive experience in applying criteria like those in our regulations under actual conditions in both Agreement and non-Agreement States. The costs to the industry as they developed detailed tailings management programs are consistent with those used in the GEIS and in developing our regulations.

Now I will discuss the status of NRC activities to work out amended agreements with the Agreement States to conform their regulatory programs to UMTRCA.

UMTRCA required the Agreement States to adopt certain procedural requirements in processing license applications, to prepare an indepedent safety and environmental assessment of the proposed activity, and to require compliance with standards which were to be adopted by the states for the protection of public health, safety, and environment which are equivalent, to the extent practicable, or more stringent than standards adopted and enforced by the Commission for the same purpose and standards promulgated by the Commission and the Administrator of the Environmental Protection Agency. Each Agreement State must enter into an amended agreement with the Commission in order to regulate mill tailings after November 8, 1981.

Six states have expressed interest in amended agreements - Colorado, New Mexico, Nevada, Oregon, Texas, and Washington. In response to a request from the Governor, NRC reasserted its authority over mill tailings in Arizona. We have also received notice from California, which presently does not have mills, that it does not plan to act now to retain authority over mill tailings after November 8, 1981, but may ask to assert that authority at a later date. Of the six states, four are currently regulating active uranium milling operations - Colorado, New Mexico, Texas, and Washington. In the event an Agreement State does not obtain an amended agreement prior to November 8, 1981, regulatory control of the tailings will revert automatically to the NRC. The Agreement State could however continue to regulate the milling part of the activity, although jurisdictional questions would likely result between NRC and the state since the milling operation is so intimately related to tailings disposal.

Agreement State involvement in the uranium mill tailings regulatory development process began prior to UMTRCA. During the preparation by NRC of the GEIS (beginning in 1976) Agreement States were consulted and their comments included. Following enactment of UMTRCA, we took a number of steps to assist the states in obtaining amended agreements. We initiated correspondence and meetings with the Agreement States regarding the various aspects of UMTRCA. A meeting was held with the uranium mill states in Denver on January 10 and 11, 1979 to discuss the Act and its requirements for Agreement States. Letters were then sent to the states alerting them to the need to begin to prepare for an amended agreement with the NRC and specifying the actions that would be necessary on their part. A follow-up letter was sent to the states on December 26, 1979 specifically stating what requirements the state would have to meet.

During this time, we worked with the Agreement States to develop the NRC criteria for amended agreements. A preliminary version sent to them in July 1980 was discussed at a working session in October 1980. These criteria were published on January 23, 1981 (at 46 F.R. 7540) and are entitled "Criteria and Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement." This document was a revision of an existing policy statement of the Commission on criteria for states which wished to enter into agreements. The additional criteria specifically addresses what is needed for an amended agreement: statutes, regulations, organizational relationships within the state, personnel, certain functions to be covered, and instrumentation. Suggested state regulations were developed and sent to the states for their use. The states have followed the suggested regulations closely.

As development of the state programs proceeded, we reviewed and provided comments on the adequacy of their statutes, regulations, procedures, staffing and other apsects. Comprehensive reviews were made by the staff in the summer of 1980 and the states informed by letters of the results. In response to revised submittals, the Governors, in early 1981, were informed by the Chairman of the NRC of our assessments of the status of the state's efforts. Currently, to minimize correspondence and facilitate the review process, we have offered to send NRC review teams to each milling state to review the details of the state's program prior to submittal by the Governor. An NRC review team examined Wahington's program on June 3 and we expect to review the other states' programs in the near future. The current status of each state in preparing for an amended agreement is shown in an attachment to this testimony.

In addition to the above activities we provided grant money to the states as permitted by UMTRCA to help finance their program development. We also established and sponsored training courses in the safety aspects of uranium milling for state personnel to increase their competence in regulating uranium millings.

The NRC has devoted timely effort in assisting the states with the development of programs suitable for amended agreements. Based on current available information, there appears to be considerable momentum and dedication on the part of the Agreement States with active uranium mills to meet the November 8, 1981 deadline for an amended agreement. We are looking forward to submittal of the final version of these programs in August and September, which should allow sufficient time for our review and administrative processing. New Mexico has requested an extension of time but not because of scheduling difficulty. The NRC's regulations are being contested. New Mexico would prefer to defer the adoption of the regulations until the judicial proceedings are completed and thus avoid a risk of having to repeat the State adoption process. Representatives from New Mexico are present today and plan to present testimony. In summary, although the schedules are tight, we see no need to extend the November 8, 1981 deadline.

I will now turn to EPA's role.

Title II of UMTRCA gave EPA the responsibility for promulgating generally applicable environmental standards to be applied at active mill tailing sites within 18 months of passage of the Act. The inability of EPA to complete this task on time has not affected our mill tailings regulatory program. Since late 1976, we have established a comprehensive mill and tailings regulatory regime by the use of staff-developed interim criteria and the issuance of formal regulations in 1980 based on the comprehensive GEIS.

There could only be a signficant impact on our program following subsequent issuance of EPA standards if those standards differ substantially from our own. We do not believe that this will happen since our respective staffs have been working closely on the subject and there does not seem to be any divergence of substance.

Apart from the disposal criteria, EPA has issued interim and immediately effective cleanup criteria for the DOE inactive tailings sites remedial action program. While we feel that the cleanup criteria are conservative, we have some reservations about the possible lack of flexibility in application. We would recommend use of these standards on a trial basis to determine their practicability prior to finalizing them. Another alternative might be to consider the criteria already used at Grand Junction since there is a long implementation history to draw upon.

Lastly, I will discuss NRC's activities with the remedial actions required by Title I of UMTRCA.

Title I of the Act provides an NRC review and concurrence role in remedial actions proposed by DOE at the abandoned tailings sites. In addition, as provided by the Act, NRC will license the final disposal sites. We have been working very closely with DOE to expedite the process as much as we can. One method we have utilized is to participate as a cooperating agency with DOE in the NEPA process, thereby eliminating a duplicative environmental review.

Another is to work with the DOE on the development of the required Cooperative Agreements with states and Indian Tribes in their early preliminary draft form. Thus far, Cooperative Agreements, concurred in by the NRC, have been signed with the Commonwealth of Pennyslvania and the State of Utah. The Agreement with the State of Colorado is in draft form, has received preliminary NRC staff input and is anticipated to be submitted to the NRC for concurrence in August 1981.

The four highest priority sites in the program are at Cannonsburg, PA; Salt Lake City, UT; Durango, CO; and Shiprock, NM. Public EIS scoping meetings were held, with NRC participation, in Cannonsburg and Salt Lake City in the spring of CY 1981. The next such meetings will be held later in June 1981 in Durango.

With regard to proposed remedial action plans at the processing sites, the three sites which have received the most study are Salt Lake City, Cannonsburg, and Durango. In the first two cases, it has been proposed to relocate the tailings approximately 90 miles from Salt Lake City and 20 miles from Cannonsburg. At Durango, the proposed relocation distances have ranged from 2-10 miles. The NRC staff is discussing its reservations on the necessity of moving any of the tailings considerable distances such as have been proposed for Salt Lake City and Cannonsburg. This is based on environmental impact during remedial action and the high cost.

This concludes my prepared remarks. I would be happy to address any questions the Committee may have.

STATUS OF AGREEMENT STATES IN OBTAINING AMENDED AGREEMENT PURSUANT TO UMTRCA

STATE	STATUTES AMENDED	REGULATIONS BEING DRAFTED	FORMAL NRC COMMENTS ON REGULATIONS	SCHEDULED STATE HEARINGS ON REGULATIONS	ANTICIPATED ENACTMENT OF REGULATIONS	ANTICIPATED DATE FOR FORMAL REQUEST FOR AMENDED AGREEMENT
New Mexico*	Yes	Yes	Jan. 29, 1981	June 11, 1981	Oct. 8, 1981	Aug. 1981
Colorado*	Not needed	Yes	Feb. 20, 1981	June 17, 1981	Aug. 1981	Aug. 1981
Texas*	Yes	Yes	Jan. 29, 1981	July 31, 1981	Sept. 1, 1981	Sept. 1981
Washington*	Yes	Yes	Feb. 10, 1981	July 14, 1981	Aug. 1, 1981	Aug. 1981
Nevada	Yes	Yes	Mar. 16, 1981	Not scheduled	July 1, 1981	Sept. 1981
Oregon	Yes	Yes	Mar. 13, 1981	July 1981	July 1981	Aug. 1, 1981

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* States with active milling activities

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STATEMENT OF THE
AMERICAN MINING CONGRESS
SUBMITTED TO THE
NUCLEAR REGULATIONS SUBCOMMITTEE
OF THE
ENVIRONMENT AND PUBLIC WORKS COMMITEE
UNITED STATES SENATE
IN CONNECTION WITH
HEARINGS HELD ON
June 16, 1981

This statement is submitted by the American Mining Congress (AMC) in connection with hearings held on June 16, 1981, before the Nuclear Regulation Subcommittee of the Senate Environment and Public Works Committee.

The AMC is an industry trade association whose membership includes producers of most of America's metals, coal, and industrial and agricultural minerals; manufacturers of mining and mineral processing machinery and supplies; and financial institutions that serve this industry. This AMC membership includes companies that mine and process a large portion of the Nation's uranium.

This Statement is intended to supplement and to expand upon the oral testimony presented on June 16, 1981, by George B. Rice, Chairman of the AMC Uranium Environmental Subcommittee. This statement describes in greater detail the concerns that AMC and its members have with respect to recent stringent regulatory actions by the Nuclear Regulatory Commission ("NRC") and the Environmental Protection Agency ("EPA") which relate to the uranium milling industry. Additionally, AMC presents briefly its views on the question of government responsibility for that proportion of tailings at active sites produced under government contract. The question is now under review at the Department of Energy pursuant to Section 213 of the DOE National Security and Military Application of Nuclear Energy Authorization Act of 1981, 94 Stat. 3203.

INTRODUCTION

A. Uranium Milling and Mill Tailings

Uranium mills process ore into uranium concentrate, or uraniumoxide (U_3O_8). This concentrate, known as "yellowcake", is subsequently converted into uranium hexafluoride (UF_6) at conversion facilities, enriched at Department of Energy gaseous diffusion plants, and then synthesized into fuel for nuclear power reactors. Uranium mills thus serve an important and essential function in the uranium fuel cycle--a cycle which culminates in the generation of electricity. Mills thus contribute in a substantial and important way to the security and economic well-being of this country, both from the point of view of the national defense and from the perspective of energy independence.

There are some 19 operating uranium mills in the United States. Contrary to NRC's assertions, this number is not likely to grow in the foreseeable future and may, in fact, decline. Although a few new mills have been constructed recently (e.g., Bokum Resources), they are not presently in operation and are not likely, in the foreseeable future, to be placed in operation. Several other new mills have been licensed for construction, but construction has either not commenced or has been undertaken on a restricted schedule. Numerous existing mills have announced plans to shut down, are operating well below capacity, or are actively exploring options of ceasing or curtailing of operation.

These developments have been accompanied by increased uranium supplies. A staff report by the International Trade Commission recently summarized the situation as follows:

> "[S]trong pressures against the nuclear fuel cycle businesses have put [uranium milling] firms on the defensive. 'Three Mile Island' (TMI), antinuclear sentiments among the public, and a worldwide capacity glut have caused uranium prices to fall and have hurt the financial security of a large number of fuel cycle companies * * * [W]ith declining construction of nuclear reactors, reactor construction delays, and the falling price of yellowcake, among other difficulties, it is safe to say that the uranium industry is not well off. Certainly the industry is not in such good stead as it might be under less combative conditions based solely upon the economics of generating electricity, both from the point of view of costs and effectiveness.."[1]

The domestic industry is simply not in a position to sustain unnecessary and unduly burdensome regulatory requirements.

Because only one to five pounds of uranium concentrate is produced for each ton of ore, a considerable volume of residual material--called mill tailings--is generated in the uranium milling process.

Milling extracts about 90% to 97% of the uranium in uranium ore as well as small amounts of other radioactive isotopes. Consequently, between 3% and 10% of the uranium in the ore, as well as naturally occurring quantities of all other radionuclides in the uranium (U-238) decay series, are retained in the tailings. Because of the presence of these residual radionuclides, the tailings are a source of radioactive emissions. The principal mechanisms for such emissions are (1) radon exhalation[2/] and (2) particulate emissions. Because the vast majority of uranium has been removed by milling, the amount of radiation released by the tailings is very low.

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[1] Uranium and Uranium Compounds 9 (February, 1981) (USITC Publication 1141).

B. Risks Associated With Radon Emissions from Mill Tailings

Radon is released into the atmosphere from a variety of natural sources in far greater amounts than are contributed by uranium mill tailings piles. NRC has indicated, for example, that "uranium milling radon releases . . . contribute . . . less than 0.0005% of radon released from natural soils in the United States."[3/] Indeed, mill tailings comprise only a small fraction of man-made releases of radon. For example, soil tillage associated with American agriculture results in well over six times the radon release currently attributable to uranium milling.[4/]

[2/] Radon-222 is a radioactive inert gas which is a decay product of radium.

[3/] NRC, Final Generic Environmental Impact Statement on Uranium Milling at 6-68 (1980) ("FGEIS"). This figure, however, is erroneous. NRC made an error in its calculations. The correct figure is .05%.

[4/] NRC explains that soil tillage results in the release of 3.1×10^6 curies of radon per year and that three times the number of uranium mills currently in existence would yield 5.5×10^5 curies per year. FGEIS at 19.

NRC and EPA regard radon as potentially hazardous because it may decay after being inhaled, potentially exposing the lungs to ionizing radiation in the process. However, no study or other scientific evidence establishes any adverse human health effect from exposure to radon in the levels in which it emanates from uranium mill tailings. NRC frankly acknowledges this fact:

> We know of no data or studies which indicate definitively that health effects do or do not occur at the low levels of exposure that are anticipated to result from operations of uranium mills."[5]

Even though NRC knows of no data indicating health effects do occur at the low levels of exposure associated with uranium milling, it postulates that some effects may occur on the basis of the "linear, non-threshold" hypothesis. This theory assumes that because high levels of radiation cause health effects, there will be proportional effects at low levels.[6]

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[5] FGEIS at A-35. The fear that tailings may be hazardous evidently arose from claims that tailings used as fill under houses in Grand Junction, Colorado caused cancer. A study has determined, however, that there is "no excess of leukemia cases associated with houses built on uranium mill tailings." Similar cancer fears were raised with respect to houses built on tailings in Durango, Colorado. A follow-up study by the Colorado Health Department concluded that "no excess of lung cancer existed for that region based on available data." FGEIS A-35. As a result of these fears, however, houses are no longer built over tailings.

[6] NRC admits that the "linear, non-threshold" hypothesis is of questionable validity. NRC states: "although this assumption may indeed be invalid, or even underestimate resulting health effects, presently available epidemiological data do not conclusively rule out the possibility of zero effects at the individual low doses and close rates involved here . . . ." FGEIS U-4.

Even under the linear non-threshold model, the risk posed by radon from unregulated uranium mill tailings is extremely small. According to NRC's calculation, it is no greater than about 2.9 in 210,000,000 (the approximate U.S. population in 1978), or roughly 1 in 70,000,000 for about three times the number of mills now in existence.[7] EPA risk estimates for inactive uranium processing sites are in accord. EPA postulates a risk of about 2 in 200,000,000, or roughly 1 in 100,000,000 for radon from inactive sites.[8]

The miniscule nature of the risk involved is essentially admitted by NRC. The agency has stated that risks of this order of magnitude (i.e., about 1 in 100,000,000) are "about equal" to the risks posed by "a few puffs on a cigarette, a few sips of wine, driving a family car about 6 blocks, flying about 2 miles, canoeing for 3 seconds, or being a man aged 60 for 11 seconds."[9] Moreover, the risk involved is a fraction of other risks commonly accepted in our society.[10]

7/ FGEIS at 19.

8/ EPA, Draft EIS for Remedial Action Standards for Inactive Uranium Processing Sites (40 C.F.R. Part 192) at 4-39.

9/ 46 Fed. Reg. 15167 (March 4, 1981) (Statement from NRC's proposed table S-3).

10/ The following table sets forth a number of commonplace and customarily accepted risks of premature death:

Cause	Individual risk/year
Smoker	1/300
Agricultural employment	1/1,700
Motor vehicle - Total (1975)	1/4,500
Air pollution - sulphates	1/6,700

(Footnote continued on next page)

Besides radon, mill tailings piles also may release dust particles due to wind erosion. These particles may result in public exposure to radiation. However, EPA has explicitly indicated that other radiological hazards "are much less significant" than the risks posed by radon.[11] Indeed, the agency has explained that "[a]t most, they increase by 10% the risk estimated for the regional population and the risk to the national population is much less."[12]

C. Statutes Applicable to Uranium Millings and Mill Tailings

Uranium mills are regulated under the Atomic Energy Act

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[10] (Footnote continued from previous page)

Cause	Individual risk/year
Government employment	1/9,100
Truck driving employment	1/10,000
Falls	1/13,000
Alcohol	1/20,000
Living for one year downstream of a dam	1/20,000
Motor vehicle - pedestrian (1975)	1/25,000
Air pollution - benso (a) pyrene	1/33,000
Drowning (from recreational activities)	1/53,000
Inhalation and injestion of objects	1/71,000
Home accidents (1975)	1/83,000
Bicycling	1/100,000
Person in room with smoker	1/100,000
One pint of milk per day (aflatoxin)	1/100,000
Accidental poisoning - solids and liquids	1/170,000
Electrocution	1/200,000
Vaccination for small pox (per occasion)	1/330,000
Air travel - one transcontinental flight/yr.	1/330,000

Source: OSHA Testimony of Professor Richard Wilson reprinted in Hutt, Unresolved Issues in the Conflict Between Individual Freedom and Government Control of Food Safety, 33 FD&C L.J. 558, 564-66 & 568 (1978).

[11] EPA, Draft EIS for Remedial Action Standards for Inactive Uranium Processing Sites (40 C.F.R. Part 192) at 4-38.

[12] *Id*.

of 1954, as amended, 42 U.S.C. 2011, et seq. As originally conceived, that statute authorized the Atomic Energy Commission ("AEC") to regulate and to license the use, possession and transfer of "source material,"[13] by-product material[14] and "special nuclear material."[15] The AEC specifically defined "source material" to include uranium ore containing more than .05% uranium by weight.[16] Under this definition, uranium mill operators have long required licenses for their milling activities.

Pursuant to Section 274 of the Act, 42 U.S.C. § 2021, the AEC was empowered to enter into agreements with states ("Agreement States") whereby federal authority over certain activities, including uranium mills, was discontinued and assumed by the states. Numerous discontinuance agreements have been entered by the AEC (and the NRC[17]) with important uranium milling states, including New Mexico, Colorado, and Washington.[18] Pursuant to these agreements, various states have regulated uranium mills in lieu of the AEC and NRC.

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[13] See 42 U.S.C. § 2014(z). Source material is defined to include (1) uranium and thorium and (2) ores containing uranium and thorium in concentrations determined by the AEC.

[14] See 42 U.S.C. § 2014(e). Until enactment of the Mill Tailings Act in 1978, "by-product material" was defined to mean "any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to radiation incident to the process of producing or utilizing special nuclear material."

[15] See 42 U.S.C. § 2014(aa). Special nuclear material is defined to mean plutonium or uranium enriched in isotopes 233 or 235, but the definition expressly excludes source material.

[16] See 10 C.F.R. § 20.3(a)(15) (ores constitute "source material" if they "contain by weight one-twentieth of one percent (0.05%) or more of (a) uranium, (b) thorium or (c) any combination thereof"). See also 10 C.F.R. § 40.13(a) & 4(h).

[17] The AEC was abolished by the Energy Reorganization Act of 1974 (42 U.S.C. § 5814(a)) and its regulatory functions were transferred to a new agency, the NRC. See 42 U.S.C. § 5841(f).

As part of its licensing activities, the AEC (and subsequently NRC) regulated the design and construction of tailings retention systems. However, since the tailings themselves did not constitute "source material," "by-product material," or "special nuclear material" as then defined by statute, the AEC had no direct control over their final disposition. This lack of regulatory control was not regarded as troublesome because tailings were not then viewed as posing significant risks. Concern over tailings grew, however, when some were used as construction material at Grand Junction, Colorado. Tailings employed as construction material may result in elevated concentrations of radon in buildings in which the material is incorporated. Congress authorized a remedial action program to address use of tailings material in building construction in Grand Junction in 1972. Pub. L. No. 92-314, §§ 201-04, 86 Stat. 226-27 (1972).

The formal regulation of uranium mill tailings was authorized by the passage of the Uranium Mill Tailings Radiation Control Act of 1978 (the Mill Tailings Act), Pub. L. No. 95-604, 92 Stat. 3021 (codified in scattered sections of 42 U.S.C.). At the time of that statute's enactment, Congress was not apprised of the actual hazard posed by mill tailings.

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[18] Some 26 agreements have been executed pursuant to this section, and many of the most important uranium-producing states are among that number. *E.g.*, 39 *Fed. Reg*. 15743 (Apr. 26, 1974) (New Mexico); 33 *Fed. Reg*. 2400 (Jan. 31, 1968) (Colorado); 31 *Fed. Reg*. 1635 (Dec. 22, 1966) (Washington); 28 *Fed. Reg*. 531 (Jan. 29, 1963) (Texas).

Title I of the Mill Tailings Act established a detailed remedial action program for the clean-up of inactive mill tailings disposal sites. The statute directed EPA to establish general standards for the protection of the public and environment from radiological and non-radiological hazards associated with the residual radioactive materials located at these sites. 42 U.S.C. § 2022(a). The Department of Energy was required to effect remedial actions "in accordance with the general standards prescribed by [EPA]." 42 U.S.C. § 7918.

Title II of the Mill Tailings Act amended the Atomic Energy Act to include mill tailings in the definition of "by-product material." Title II also amended the Atomic Energy Act to provide explicitly for stabilization and decommissioning of the uranium mill tailings at active mill and disposal sites. As it had done with respect to inactive sites covered by Title I, Congress delegated to EPA the overall responsibility for promulgating "standards of general application for the protection of the public health, safety, and the environment from radiological and non-radiological hazards associated with [mill tailings]." 42 U.S.C. § 2022(b). The role of the NRC, along with the various Agreement States, was to be the "[i]mplementation and enforcement" of the standards promulgated by EPA. 42 U.S.C. § 2022(d). Agreement States, however, were required only to adopt and implement the federal requirements "to the extent practicable." 42 U.S.C. § 2021(o)(2).

Congress required EPA to promulgate its standards within eighteen months after the enactment of the Mill Tailings Act. 42 U.S.C. § 2022(b). Agreement States were given eighteen additional months (see 42 U.S.C.A. § 2021 note) to conform their programs "to the extent practicable" to federal requirements. EPA, however, failed to promulgate its measures within the prescribed period; in fact, EPA has yet to propose standards for active milling and disposal facilities. EPA has just recently published proposed standards for inactive disposal sites, 46 Fed. Reg. 2556-63 (Jan. 9, 1981).

D. Recent Regulatory Efforts Applicable to Uranium Milling and Mill Tailings

Three regulatory efforts have recently been taken with respect to uranium milling and mill tailings. On October 3, 1980, NRC promulgated new uranium mill licensing requirements (45 Fed. Reg. 65521). These became effective on November 17, 1980. On January 9, 1981, EPA proposed clean-up and disposal standards for inactive uranium processing sites (46 Fed. Reg. 2556). On January 13, 1977, EPA issued standards limiting radiation doses to the public to 25 millirems per year (40 C.F.R. 190). This standard became effective for uranium mills on December 1, 1980.

AMC's concerns with those regulations are outlined below.

II. NRC'S URANIUM MILL LICENSING REQUIREMENTS

A. The NRC Requirements

NRC has recently taken important action with respect to both active and inactive sites before issuance of EPA's standards. On October 3, 1980, NRC issued its Uranium Mill Licensing Requirements (45 Fed. Reg. 65521). These regulations specify detailed standards for the reclamation of uranium mill tailings and also impose many stringent requirements upon uranium mills. The gravamen of NRC's final Uranium Mill Licensing Requirements are the various "criteria" set forth in Appendix A to Part 40. See 45 Fed. Reg. 65533-36. The various criteria may be divided into three categories: the "Technical Criteria," the "Financial Criteria," and a single "Land Ownership Criterion."

The "Technical Criteria" are embodied in Criteria 1 through 8A and 12. These impose various requirements for the siting and decommissioning of mill tailings and for mill operations. Criterion 6 is a critical provision. It provides that radon emanation from decommissioned tailings must be reduced to 2 picocuries per meter per second (2 pCi/m^2-sec) or less and that tailings be covered with at least three meters of soil. Criterion 3 designates below-grade disposal as NRC's "prime option." Criterion 5 forbids groundwater degradation. Criteria 1 and 12 provide that all disposal must be so as to require no ongoing maintenance.

The "Financial Criteria," numbers 9 and 10, require that mill operations establish third-person surety arrangements to cover decommissioning costs and in addition pay a minimum of $250,000 (1978 dollars) to the "general treasury of the United

States or to an appropriate State agency" prior to license termination. The "land ownership" Criterion (number 11) provides for government ownership of uranium mill tailings sites upon decommissioning.

NRC has recently indicated that it intends to apply the standards to remedial action taken by the Department of Energy. Memorandum, Shaffer (NRC) to Scarano (NRC). April 14, 1981 (attached as Tab __). Thus, the Department of Energy, like industry, faces the eminent application of these stringent requirements to the inactive tailings piles for which it is responsible.

B. Costs of Compliance

The costs to comply with the Uranium Mill Licensing Requirements are excessive. The Department of Energy currently estimates that the cost to comply at inactive sites alone will exceed $500,000,000. The cost to comply at all active sites will be even greater. According to NRC's own estimates, as best we can determine, operating mills must expend $760 million and $1.5 billion to comply with the 2pCi/m^2-sec radon emanation standard alone.[19/] NRC has indicated that an equal or greater amount will be necessary to comply with the ground-

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[19/] FGEIS at 12-22. NRC's estimate is based on the assumption that no transfer of tailings from existing sites will be required. Costs for transfer and below-grade disposal could easily raise NRC's estimate by an order of magnitude.

water protection requirements.[20/] Industry's estimate of the cost of compliance is no less than three times the amounts acknowledged by NRC. Whoever is correct, this is a tremendous sum to expend to protect against a hypothetical risk which, if it exists at all, is admittedly no greater than about 1 in 1,000,000,000 and which is far less than a host of known hazards commonly and readily accepted in our society.

C. The Requirements are Unreasonable

NRC's regulations are not based upon a determination that uranium mills pose an undue risk in comparison to other hazards or, indeed, upon a finding that any significant risk exists from tailings. Nor are the regulations the product of a reasoned evaluation of the relationship between the miniscule potential risks sought to be averted and the tremendous costs imposed.[21/] Rather, NRC simply set out to reduce any such risks as might possibly exist to "as low as reasonably achievable."[22/]

[20/] Compare GEIS at 22 with GEIS at 18. NRC unfortunately has failed to provide clear estimates for compliance with portions of its regulations other than Criteria 5 (groundwater) and 6 (radon).

[21/] See, e.g., GEIS at 12-19 (declining "to attempt . . . quantified balancing of costs and benefits" for radon control measures).

[22/] GEIS at 14.

The Supreme Court in Industrial Union Dept., AFL-CIO v. American Petroleum Institute, 448 U.S. 607, 65 L. Ed.2d 1010, 100 S. Ct. 2844 (1980), recently vacated benzene exposure regulations, developed by the Occupational Safety and Health Administration, that were based on essentially the same premise. The Court concluded that before creating any safety regulation, OSHA should determine "that significant risks are present and can be eliminated or lessened by a change in practices." Id. at 2864 (emphasis added). Justice Powell (concurring), further observed:

> "A standard-setting process that ignored economic considerations would result in a serious misallocation of resources and a lower effective level of safety than could be achieved under standards set with reference to the comparative benefits available at a lower cost." Id. at 2878.

NRC's regulations in contraven these principles of law.

NRC's creation of its broad license requirements prior to EPA's development of "standards of general application" also plainly is contrary to the regulatory plan established by Congress in the Mill Tailings Act. Under the division of authority established by Reorganization Plan No. 3 of 1970, §2(a)(6),[23/] and the Energy Reorganization Act of 1974,[24/] EPA has traditionally been responsible for establishing overall

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[23/] 42 U.S.C.A. § 4321 note.

[24/] See 42 U.S.C. § 5841(f).

standards, which NRC is charged with implementing through its licensing and regulatory functions. Congress clearly manifested its intent that these roles continue with respect to regulation of mill tailings.[25] Indeed, even NRC Chairman Hendrie testified in opposition to one bill that assigned the "standard-setting task to the NRC with EPA in the consulting role," criticizing it as an "undesirable reversal of the present regulatory roles of the two agencies."[26]

NRC's promulgation of its regulations, on the basis of some unspecified purported statutory authority, destroys the regulatory scheme crafted by Congress,[27] runs counter to its own representations to Congress, and invades the regulatory role statutorily assigned to EPA. Many of NRC's criteria--such as numbers 5 and 6, precluding any groundwater degradation and limiting radon emanation to $2pCi/m^2$-sec-- blatantly usurp the standard-setting function delegated to EPA.[28] Moreover, NRC manifestly may not produce any of its licensing requirements prior to EPA's development of the very standards, which NRC is charged to implement through its licensing authority without unlawfully invading EPA's standard-setting role. NRC's unlawful tactics could result in millions of dollars in wasted expenditures when its requirements are amended to conform to the standards eventually issued by EPA.[29]

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[25] See 42 U.S.C. § 20 22(b) & (d). See also, Hearings on H.R. 11698, 1229, 12938, 12535, 13049 and 13650 before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 95th Cong., 2d Sess., 343, 366 and 396 (1978).

[26] Hearings on H.R. 13382, 12938, 12535 and 13049 before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 95th Cong., 2d Sess., 78 (1978).

[27] Senator McClure specifically admonished that "We do not want to see NRC out there doing exactly what EPA is required to do and is doing." 124 Cong. Rec. S15324 (daily ed., Sept. 18, 1978).

[28] See H.R. Rep. No. 1480, Part I, 95th Cong., 2d Sess. 16-17 (1978) (EPA to produce standards governing "allowable concentrations in air or water" and "quantities of substances released over a period of time").

As a result of NRC's unlawful actions and the unreasonable costs imposed, NRC's regulations are presently being challenged in the United States Court of Appeals for the Tenth Circuit.[30] In addition to the flaws described above, those challenging the rules have argued generally, for example, that NRC violated statutory procedure in creating its regulations, and that NRC's application of its regulations to existing operations (which could have anticipated those requirements neither in design nor budgeting) is manifestly unreasonable and contrary to Congress' intent. Numerous more specific attacks also have been made on individual requirements. For instance, it is contended that NRC's uniform, absolute ban of ongoing maintenance of tailings piles exceeds NRC's statutory authority,[31] and that its absolute exclusion of self-insurance (even for large, diverse corporations) as a means of establishing financial responsibility for decommissioning disposal sites[32] is arbitrary and capricious.

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[29] NRC has admitted that its "regulations will be revised, if required, when EPA standards are issued." 45 Fed. Reg. 65523.

[30] AMC, et al. v. United States, et al., No. 80-2271; Kerr-McGee Nuclear Corp., et al. v. NRC, et al., No. 80-2043.

D. Undue NRC Pressure on Agreement States

Despite serious questions as to the validity of its regulations, NRC has pursued a hardline approach to implementation of those regulations. Most significantly, it has insisted--allegedly pursuant to 42 U.S.C. § 2021(o)(2)--that Agreement States adopt regulations at least equivalent to its own before November 8, 1981. This timetable obviously precludes adequate independent consideration by Agreement States of their own regulatory programs, particularly when viewed in light of NRC's having taken five years to formulate its requirements and EPA's failure, even as yet, to develop standards.[33] Moreover, NRC has asserted in letters to governors of the Agreement States that its regulations represent "minimum national standards" to be adopted by the States (Example attached as Tab __). This flatly contravenes Congress' intent, embodied in 42 U.S.C. § 2021(o)(2), that States adopt regulatory programs equivalent to federal standards "to the extent practicable" in light of local conditions.[34] It also renders meaningless the carefully drawn statutory requirements that Agreement States afford interested parties a hearing on State Mill Tailings Act regulations.[35] NRC is taking the position that unless Agreement States adopt the Uranium Mill Licensing Requirements as directed, they will lose their regulatory jurisdiction over mill tailings.

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[31] See 42 U.S.C. § 2201(x)(2) (ongoing maintenance to be eliminated "to the maximum extent practicable").

[32] See 42 U.S.C. § 2201(x)(1).

[33] NRC action toward these regulations commenced in response to a petition filed by the Natural Resources Defense Council in May, 1975.

III. EPA PROPOSED CLEAN-UP AND DISPOSAL STANDARDS FOR INACTIVE URANIUM PROCESSING SITES

A. EPA's Proposed Standards Fail to Conform to the Requirements of the Uranium Mill Tailings Radiation Control Act

1. The Purpose of the Uranium Mill Tailings Radiation Control Act

The Mill Tailings Act states that "uranium mill tailings . . . may pose a potential and significant radiation health hazard to the public" (emphasis added).

Thus, the Act requires the development of a program to control tailings in a safe manner. However "safe" is not tantamount to risk-free. Reasonably construed, the Act requires only that significant risks be minimized by "reasonable efforts." Industrial Union Dept., AFL CIO v. American Petroleum Institute, supra.

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[34] NRC has further taken the position in its correspondence with the governors that it has determined in generic fashion that its regulations are "practicable" for adoption by all the Agreement States. Aside from the fact that any such determination was arrived at in violation of procedural requirements, such a generic determination of "practicability" plainly is contrary to the language and intent of § 2021(o)(2).

[35] See 42 U.S.C. § 2021(o)(3).

2. EPA Has Failed to Establish a Need for the Proposed Standards

EPA has not provided an adequate assessment of the nature and extent of the hazard, if any, posed by residual radioactive materials. Rather, their analysis is based on a series of assumptions that conclude that some health effects may occur.

EPA acts on the assumption that any risk is unacceptable. No comparison with other publicly accepted risks is made. No clinical evidence of medically significant effects is presented. No attempt to assess realistically the harm or risk is made. EPA admits that at the low radiation levels involved, the effects may not even be detectable (DEIS page 4-1). Only a brief, theoretical assessment of the health risks posed by the tailings piles is made. Further, this assessment makes no attempt to distinguish scientifically the various theoretical risk estimate techniques. The estimates are based on unpublished scientific documents which have not been subjected to peer review. Reliance upon such questionable information is inappropriate, in light of the fact that published information of high scientific credibility is available. E.g. the National Academy of Science's BEIR III Report and "Estimate of Risk From Environmental Exposure to Radon-222 and Its Decay P[illegible]cts," R.D. Evans, et al., Nature, 290, March 1981.

To put EPA's risk estimates in perspective, they should be compared to other commonplace risks. EPA's assumed estimate is about 2 premature deaths per year. Other known risks of fatalities per year are: all accidents - 100,000; automobile accidents - 50,000; alcohol - 56,000; drowning - 8,000; poisons - 4,000; choking on food - 3,000; and firearms - 2,500. NRC's Generic Environmental Impact Statement (NUREG-0706) estimates the number of premature deaths in the U.S. from background radiation alone will be 7,700 per year. Thus, the 2 assumed fatalities per year from the inactive tailings sites is a small fraction of the actual risks commonly faced by the public.

The costly remedical action standards are based not on substantive evidence of significant risk of material harm, but on a series of assumptions and policy considerations designed to eliminate all possible theoretical risks which might be posed by uncontrolled tailings. Such standards are contrary to the Uranium Mill Tailings Radiation Control Act and are unreasonable and arbitrary.

B. DEIS Does Not Comply With the National Environmental Policy Act

The Mill Tailings Act requires that the program for control of tailings be conducted in an environmentally sound manner. The National Environmental Policy Act requires the consideration of the environmental impacts of the regulations. These two acts require that an assessment of the environmental impacts of the standards be conducted to assure that less environmentally disruptive alternatives be considered and that environmental mitigation measures are included where practicable.

C. The Proposed Standards are Unreasonable

1. Natural Background Assumptions are Erroneous

The proposed standards are based on the erroneous assumption that there is an "average" or "normal" background radiation level. Due to the extremely wide range of environmental conditions which exists in nature, the use of a computed average as the basis for the standards is not representative of background conditions. The standards should either be on a site-specific basis or, if general standards are to be applied, they should be within the range of natural background.

2. Radium in Soils

The proposed clean-up standard for radium-226 in soils provides for reasonable assurance that in any 15 cm thickness below 1 foot the Ra 226 concentration shall not exceed 5 pCi/gm.

This standard is based upon EPA's consideration of the radon exposure pathway. EPA relies upon two basic assumptions. These are (1) radium-226 soil concentrations of 5 pCi/gm or greater will result in radon decay product levels in structures in excess of 0.01 WL, and (2) indoor radon decay products in excess of 0.01 WL pose an unacceptable health hazard.

The conclusion that indoor radon decay products in excess of 0.01 WL pose an unacceptable health hazard ignores the fact that a significant number of structures in the U.S. exceed the proposed limit of 0.015 WL even though they are not associated with tailings.

Further Radon flux rates for a given Ra-226 soil concentration depend upon a variety of conditions including, for example, grain size distribution, moisture content, compaction, and barometric pressure. Indoor radon decay product levels are dependent on the type of building materials and configurations. Thus, no correlation between radium-226 in soils and indoor radon levels has been established.

EPA relies on two publications for its conclusion that a 5 pCi/gm radium level correlates with a 0.01 WL. One is the Healy and Rogers report which makes a preliminary study of radium-contaminated soils. The report argues, it does not conclude, that indoor radon decay product concentrations of 0.01 WL might be expected for soils with radium concentrations of 1 to 3 pCi/gm. This is not a reliable scientific basis for standard setting.

EPA relies on the NRC Staff Technical Position on Interim Land Clean-up Criteria for Decommissioning Uranium Mill Sites in the NRC Draft GEIS. EPA uses this document to conclude that 3 to 5 pCi/gm of radium can cause indoor concentrations of 0.01 WL. However, Draft GEIS indicated radon levels inside structures on land averaging 5.0 pCi/gm Ra-226 would range anywhere from 0.0024 to 0.04 WL units. This wide range of radium values points out the questionable validity of using radium-226 concentration as a standard for remedial action.

A Comprehehsive analytical study of radon flux rates that can be anticipated under conditions typical of uranium mining conditions in the western United States has recently been completed by industry. This was provided to EPA as part of AMC testimony on EPA Resource Conservation and Recovery Act Regulations (Statement of S. Baker on March 9, 1979). The study shows that structures with average ventilation which are situated on reclaimed waste rock deposits having Ra-226 concentrations averaging 20 pCi/gm to infinite depth will normally exhibit radon decay product concentrations on the order of 0.01 WL. Similar structures situated on deposits having Ra-226 concentrations averaging 20 pCi/gm near the surface and up to 70 pCi/gm below to infinite depth are shown to exhibit decay product concentrations no greater than 0.02 WL. From this study, it can be seen that using a 5 pCi/gm radium-226 concentration to determine when indoor radon decay product concentrations exceed 0.01 WL is unreasonable.

Inadequate consideration has been given to the practical problems associated with the implementation of the proposed standards. Current field instrumentation cannot detect radium-226 concentrations in the specified layers. Another problem is attributing radium-226 levels to tailings contamination. Considering the wide range of radium background concentrations in the western states, it will be difficult to determine whether radium-226 levels are due to tailings contamination or to natural pockets of high background levels. In addition, the problems inherent in existing analysis techniques for radium-226 are ignored. Present techniques are slow and time consuming and lack the precision necessary to measure low concentrations accurately.

Since the radium standard is not directly related to health effects, an assessment of alternative bases for standards should be considered, for example gamma flux. A flexible standard based in part on local background concentrations may be another potential alternative. Reclamation standards should be considered. Such alternatives could provide the degree of health protection desired for the public at a much reduced cost.

3. Radon Emanation Rate

EPA has proposed that radon emanation from inactive tailings piles not exceed an average annual rate of 2 $pCi/m^2/sec$. EPA's justifications for such a standard are: that it will return radon flux to levels near background; that the cost of meeting the 2 pCi limit will be only 10% more than meeting some less stringent level of control; and that it will avert an estimated 200 lung cancer deaths per century.

The assertion that 200 lung cancer deaths will result if no remedial action is undertaken is erroneous. Better data (Evans, et al.) indicate that no more than 30 per century might occur. Thus the risks associated with radon emissions from tailings are insignificant. EPA's stated objective of returning radon flux to levels in the range of natural background is not related to health risk and therefore is not an appropriate basis for a health standard.

The inactive site standards must be based on a reasoned evaluation of health risk. They must also be cost-effective. EPA states that the 2 pCi standard is reasonable, because it will only cost 10% more than a standard of 10-40 pCi. Ten percent of several hundred million dollars is an absurd amount to spend to achieve negligible benefits. Even if EPA's estimate of health effects were accurate, it is unreasonable to spend hundreds of millions of dollars to prevent the equivalent of 2 estimated deaths per year from lung cancer -- a number that is totally indistinguishable from the thousands of deaths attributed to lung cancer every year in the United States. The EIS estimates that a radon exhalation limit of 2 pCi will prevent 99.6% of the projected 200 health effects that would occur each century if the piles were left uncovered (EIS, p. 6-7). The 1978 Uranium Mill Tailings Radiation Control Act does not mandate a total elimination of risk as proposed by EPA.

4. Indoor Radon Daughter Concentrations

The 0.015 WL remedial action level for habitable buildings was promulgated without public comment by EPA as an interim cleanup standard. This interim standard is inconsistent with the remedial action level set for persons residing on Florida phosphate lands, namely 0.02 WL, including background. The source document cited as support for the 0.015 WL level in the Draft EIS is AR 79, p 4-40, which is an unpublished document.

EPA's risk factor of 10^{-3} per WLM for radon related health effects is not generally accepted. Moreover, EPA acknowledges the large uncertainty surrounding risk estimates. The most scientifically based risk assessment factor is 10^{-4} per WLM as an upper bound of the risk (Evans, et. al.). This upper bound value is based on meticulous review of all USA and Czeckoslovakian uranium mining epidemiologic data. Based on these data, there is no proper scientific basis for selecting the unnecessarily restrictive value of 0.015 WL for the indoor radon exposure limit, including background values.

NRC's 10 CFR 20 recommends a level of one-tenth the occupational exposure limit for nonoccupational exposures, or 0.03 WL. This is a more rational level with wide acceptance in the scientific community. The Surgeon General recommended 0.05 WL as an upper limit for cleanup in Grand Junction buildings built over uranium mill tailings. The U.S. Radiation Policy Council advises that a generic study of the frequency distribution of radon exposure in structures should be undertaken before comprehensive Federal control measures. At this time, AMC rely on the Surgeon General's guidelines of 0.05 WL for cleanup of potentially contaminated habitable structures near inactive tailings areas.

5. Groundwater Contamination

AMC has a number of specific concerns with respect to the ground and surface water standards. EPA has not given any consideration to the existing or anticipated uses of the surface and groundwater it is proposing to regulate. Because of the shallow depths of many uranium ore deposits, it is not uncommon for the original quaility of water, where a tailings disposal site is located not to be suitable for drinking. EPA's proposed regulations treat virtually every water bearing formation or water body as if it were a drinking water source.

The proposed regulations require that seepage not cause concentrations of selected elements in groundwater which exceed the maximum contaminant levels for particular substances under the National Interim Primary Drinking Water Standards. This makes little sense. For example, if the initial water quality of an aquifer underlying a uranium mill tailings pond renders it suitable only for industrial use, no purpose would be served by prohibiting an increase in the concentration of one of the listed substances. EPA has arbitrarily lifted standards from one statute applicable to drinking water and applied it to another statute intended to govern groundwater.

Certain criteria listed in Table A are unduly restrictive and are commonly exceeded by normal background conditions.

The suggested limit of 10 pCi/liter for uranium does not appear to have any sound scientific basis. EPA has not established a health need for these groundwater standards as required by the Mill Tailings Act. Further, guidelines for uranium in water have been promulgated by other federal, state, and international agencies. NRC, based on chemical toxicity, proposed 30,000 pCi/l for workers which calculates to 3000 pCi/l after dilution. The Wyoming Department of Environmental Quality has adopted 5 mg/l or 34000 pCi/l. Colorado Department of Health suggests 10 pCi/l is too retrictive. The ICRP (Publication 30-1979) established an annual intake for workers based on radiological effects equivalent to 14,800 pCi/l for the public.

D. The Costs of the Proposed Standards are Underestimated

1. Costs are Ignored

AMC notes numerous omissions and inadequacies in the cost estimates in Appendix B of the DEIS. Costs for engineering, field supervision, and contingencies are not considered. Provisions for reclaiming the land from which topsoil, cover, or riprap are obtained are not considered. Riprap is not a readily available material, nor is it free. In some locations, suitable clay materials are not available; or if available, only from distant locations. These costs are not considered.

The unit costs in the DEIS were compared with costs being experienced in actual tailings dam reclamation work. For below-grade excavation, transportation, synthetic liners, and soil and vegetation cover costs, the industry figures are 2.5 to 3 times higher than those in the DEIS.

To evaluate the effect of the estimating methods as well as the unit costs, estimates for two cases comparing EPA and industry figures were made. For Option 2 (reclamation in place), industry costs were from 1.8 to 2.7 times higher than EPA's. In comparisons for moving the tailings to a new disposal area (option 3 in the DEIS), the industry figures were from 2.7 to 2.9 higher than the EPA estimates.

The EPA estimates do not include the costs for reclamation of the borrow sites. They make no provision for costs of cleanup around the mill sites, remedial action at offsite locations where tailings may have been used for fill material, survey and decontamination of used equipment, burial of contaminated equipment, demolition and disposal of buildings or reclamation of the mill site.

2. Total Cost of Project

AMC believes the total remedial costs for the 24 inactive mill sites which EPA estimates at $200-300 million (page 5-3 and 9-8 in the DEIS) will more likely approach $1 billion if the proposed EPA standards are adopted.

We have estimated the total cost of the 24 inactive mill sites assuming 17 are reclaimed in place and 7 are moved to new below-grade disposal sites (Table 2-4, pages 2-16 and 2-17 in DEIS). Based on EPA estimates, the total costs will vary from $50 to $200 million. This is the cost for tailings reclamation only and does not include many other remedial actions required. Industry estimates show that the total tailings reclamation cost could range from $140 to $450 million.

3. Cost-Benefit Considerations

The DEIS states that "...reducing an uncontrolled radon release rate of 450 pCi/m^2/sec to ~~10pCi/m2/sec~~ would avert 98% of the potential effects of radon emitted from the uncontrolled pile." Taking into consideration all the inactive piles, this would theoretically reduce the estimated 2 premature deaths per year to 0.04 per year.

Using a more recent estimate of risk from exposure to radon-222 as proposed by Evans et. al., the 90% reduction of radon would reduce the premature deaths from 0.3 per year from the uncovered piles to 0.006 per year. This would be equivalent to a cost of $2.3 million (EPA) to $17 million (industry) per premature death averted per century.

Reducing radon by approximately 80%, or to an emanation rate of 100 pCi/m^2 x sec, would reduce premature deaths from 0.3 to 0.06 per year at a total cost of $50 to $350 million. Even at this level costs will be $2 million (EPA) to $15 million (industry) per premature death averted per century, still an unreasonable figure.

In summary, we believe the total cost for the entire remedial action project designed to meet the proposed EPA standards will likely approach a billion dollars. This will result in a cost-benefit ratio which using even the lowest figures, exceeds reasonable limits. Less restrictive standards will greatly reduce costs, will insure long-term stabilization, and will reduce health risks which, even without controls, are not at unacceptable levels. In fact, in terms of reducing health effects the expenditure of $500 million to $1 billion, would be better spent on other more critical risk avoidance measures.

Because Congress and state legislatures must approve the appropriations for all remedial action, it appears prudent in these times of budget constraints to develop standards which are reasonable and which may be accomplished at the lowest possible cost. The magnitude of costs required to meet EPA's unnecessarily strict standards may jeopardize the entire program.

IV. EPA'S RADIATION PROTECTION STANDARDS OF 40 CFR 190

On January 13, 1977, EPA promulgated its Uranium Fuel Cycle Standard (40 CFR 190) which limits annual radiation exposure to the public, excluding contributions from radon, to 25 millirem for the whole body and internal organs except the thyroid, which is limited to 75 millirems. This standard will be enforced by NRC. Reorganization Plan No. 3 of 1970, 84 Stat. 2086.

Although the standard applies to the entire uranium fuel cycle, the primary source of 40 CFR 190 exposures are particular emissions from uranium mill yellowcake drying operations and from uranium mill tailings piles. When promulgated, EPA admitted that the risk of particulate emission from uranium mills was "quite small," and NRC asserted that the standard was, as a practical matter, unenforceable through environmental monitoring.

According to NRC, a high degree of control of particulate emissions from exposed tailings surfaces will be necessary to comply with 40 CFR 190. (FGEIS at 12). AMC estimates that the cost of compliance will approach $1 billion per health effect averted. The reduction in the already small risks that will accrue from these extensive efforts, however, is minimal or, as expressed by NRC:

> Risks to nearby individuals are small in relation to those from background radiation and those to an average individual are smaller still by over a factor of 100. Milling would contribute risks to an average individual amounting to less than 2 percent of those from background, even in the worst case mill cluster situation.[36]

Indeed, NRC concedes that the risk reductions achieved by these controls accrue primarily from incidental reductions in radon releases, not 40 CFR 190 releases.[37]

In addition, controls necessary to comply with 40 CFR 190 "do not provide substantial reductions in overall radiation risks."[38] (FGEIS at 9-9). According to the NRC, compliance with 40 CFR 190 will reduce risks from uranium mill operations only by 16 per cent, because the small risks that do exist "arise primarily from radon emissions from the tailings impoundment."[39] Thus,

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36/ FGEIS at 12.

37/ *Id*. NRC estimates that the risk of premature cancer death to the maximally exposed individual reduced by 6 per 100,000, primarily because of lower radon emissions. (FGEIS Table 9.6 at 9-9).

38/ FGEIS at 9-9.

39/ *Id*.

reduction of 40 CFR 190 releases will provide no significant risk reduction benefits to the public.

On October 14, 1980, AMC petitioned EPA to reconsider and revise its 40 CFR 190 regulations. AMC's petition, which has not been decided by EPA, was based on three primary considerations.[40]

First, relevant developments have occurred since the promulgation in January 1977 of 40 CFR 190 that render this regulation unreasonably burdensome on the uranium milling industry. These developments include: EPA's new model mill which differs from the model used to develop the existing standards (EPA Radiological Impact Caused by Emissions of Radionuclides into Air in the United States, hereafter RI 1979); new dispersion and dosimetry codes (AIRDOS-EPA and NRC-MILDOS); new dose conversion factors (Killough _et al_. 1979); new health effects conversion factors (ICRP 26 1977 and BEIR III 1980); and new cost data for source term controls (NRC GEIS and Industry surveys). These new developments establish that the 40 CFR 190 radiation protection standards are neither practicable nor cost-effective.

Second, even EPA has recognized that the health effects of particulate emissions from uranium milling are "quite small" (40 _Fed_. _Reg_. 23421). Moreover, it is beyond dispute that the relative risk of uranium milling, even to the maximally exposed individual, is small when compared with other risks of every day life. In these circumstances, the stringent standard for mills, which for whole body dose is radically reduced from 500 millirems per year, should be reconsidered in light of the recent decision involving benzene. Industrial Union Dept., AFL-CIO v. American Petroleum Institute, supra.

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[40] A copy of the petition is attached to this Statement. The petition supports in detail AMC's three concerns with 40 CFR 190.

Third, the 25 millirem standard as applied to uranium mills should be reconsidered in view of serious inadequacies in the existing administrative record for 40 CFR 190. For example, no explanation of the basis for the 25 millirem standard is given. Why this number is chosen--rather than 50 or 500--is a mystery.

In summary, when the new information and the inadequacies of the administrative record are considered together in light of recent judicial precedent, EPA failed to fulfill its rulemaking responsibility to set a standard that is appropriate for the milling segment of the uranium fuel cycle. See National Lime Association v. EPA, 627 F.2d 416 (D.C. Cir. 1980).

In addition, the standard is not enforceable by environmental monitoring. NRC expressly stated this proposition in its comments on the proposed 25 millirem standard. These comments were:

> [T]he proposed approach in 40 CFR Part 190 emphasizes environmental monitoring, which, for the extremely low radiation levels of interest here, has been proven to be highly inaccurate even with the most sophisticated measurement devices. The inaccuracy of environmental monitoring for extremely low levels of radioactive materials cannot be remedied by costly development of instrumentation because the low levels of man-made radiation in the environment are small com-

> pared to levels of natural radiation. In addition, the inherent variability of climatic and other environmental conditions, including background radiation, seriously detracts from the practicality of using environmental monitoring to demonstrate compliance with the proposed standard.

Faced with AMC's petition, which demonstrated that 40 CFR 190 was not cost effective and, indeed, could not be complied with at most mills, NRC, changed without any explanation its position. Thus, NRC abandoned predictive modeling concepts that had been used to develop the standard, and decided that enforcement should be based upon environmental monitoring. This was a complete reversal of its previous position. In testimony submitted to EPA regarding 40 CFR 190, NRC asserted that (1) EPA had incorrectly assessed radioactive effluent control technology and the practicability of compliance with the proposed standards: (2) the proposed standards would be impracticable to implement for technical and economic reasons for major components of the uranium fuel cycle, notably mills; and (3) that it would, as stated above, be impossible to demonstrate compliance at the low levels specified in the standards using environmental monitoring.

Finally, EPA changes dispersion models and dose conversion factors with no notice and comment. This effectively changes the standard with no public input whatsoever.

D. Commingled Tailings

A significant portion of the material in 12 existing tailings piles is directly attributable to uranium produced for and sold to the United States Atomic Energy Commission (AEC), particularly for the period prior to 1970. It is clearly unfair to require industry to expend large sums to "clean-up" tailings produced in compliance with then-existing AEC regulatory requirements under contracts for sale of uranium concentrate to the AEC.

This conclusion is fully supported in a report by the Comptroller General entitled "Cleaning Up Commingled Uranium Mill Tailings; Is Federal Assistance Necessary?" In the report, dated February 5, 1979, the Comptroller General stated that

> "the most significant factor in favor of providing Federal assistance in cleaning up commingled tailings pertains to the role of the Federal Government in creating the mill tailings situation. The mill owners apparently acted in good faith in carrying out their responsibilities in meeting various contract provisions and legal obligations. Unfortunately, like the Federal Government, they did not recognize that the tailings were a health hazard and did not provide for their control. Now, the Federal Government is requiring the mill owners to clean up all of the tailings, including those generated before the hazard was recognized. In our view, it is unfair for industry to bear all of the costs in cleaning up the tailings."[41]

In accordance with this view, the Comptroller General recommended to Congress that the federal government assumes at least some of the burden in cleaning up tailings:

> "In order to assure that the uranium mill tailings are controlled in safe and

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[41] Report at 14.

> environmentally sound manner, we recommend that the Congress provide assistance to the active mill owners to share in the cost of cleaning up that portion of the mill tailings that were generated under Federal contracts. These are the tailings for which the Federal Government has a strong moral responsibility."[42]

The Comptroller General also recognized the serious inequities involved in the retroactive application of costly new regulatory requirements to tailings generated for non-governmental purchasers.[43] The Comptroller General accordingly recommended that Congress also consider defraying at least some of the expenses associated with tailings generated prior to the advent of increased federal regulation even if the tailings were generated for commercial rather than governmental purchases. In the words of the Comptroller,

> "The Congress should also consider having the Federal Government assist those mill owners who acted in good faith in meeting all legal requirements pertaining to stabilization of the mill tailings that were generated for commercial purposes and for which the Federal Government, through NRC, is now requiring retroactive stabilization."[44]

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[42] *Id.*

[43] Retractive application poses serious difficulties because it is generally not possible for mill owners to obtain compensation for expenditures required to comply with costly new requirements pertaining to previously generated tailings from the uranium purchasers for whom the tailings were generated.

[44] Report at 14.

Consistent with the recommendation of the Comptroller General, Congress in 1980 required the Secretary of Energy to develop a plan by October 1, 1981 for a cooperative program to provide assistance in the stabilization and management of uranium mill tailings which resulted from ore processing under contract with the United States. See Section 213 of the Department of Energy National Security and Military Application of Nuclear Energy Authorization Act of 1981, 94 Stat. 3203. It is imperative that Congress press forward with an appropriate assistance plan in view of the imminent application of NRC's stringent Uranium Mill Licensing Requirements.

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•Executive Committee
†Honorary

June 19, 1981

The Honorable Alan K. Simpson
Chairman, Nuclear Regulation Subcommittee
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Senator Simpson:

On June 16, 1981, the Subcommittee on Nuclear Regulation held hearings on the status of regulations under Titles I and II of the Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604, 92 Stat. 3021. At these hearings, George B. Rice testified on behalf of the American Mining Congress as Chairman of AMC's Uranium Environmental Subcommittee. During the course of those hearings, Senator Domenici requested, on your behalf, additional information from the AMC. This letter addresses these various informational requests.

1. *NRC's Interpretation of Agreement State Authority*. At the hearing, NRC's witness, John Witte, indicated that Agreement States need not adopt NRC's mill lincensing regulations to the extent the States found those regulations to be impracticable. AMC agrees with this conclusion, which follows from the language in the statute that Agreement States must adopt standards that "are equivalent, *to the extent practicable*, or more stringent than" federal standards.

However, in letters to governors of Agreement States, NRC stated a contrary view. Former NRC Chairman Ahearne specifically informed Governor King of New Mexico that New Mexico must adopt mill tailings regulations "which are equivalent to, or more stringent than, those of the Commission."[1]

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[1] A copy of this letter with attachments is enclosed as Exhibit A.

As explained in an attachment to that letter:

> The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS which addressed operations in both Agreement and Non-Agreement States. The Commission regulations constitute minimum national standards.

(Exhibit A, Encl. 2, p. 1; emphasis in original)

NRC confirmed this position in its Opposition to the Motion for Stay filed in Kerr-McGee Nuclear Corp., et a. v. NRC, et al., No. 80-2043 and consolidated cases (Tenth Circuit).[2] NRC stated:

> [i]t is unreasonable to interpret the UMTRC Act as authorizing the states independently to determine the extent to which their implementation of NRC Requirements would be practicable.

Exhibit B at 27.

Furthermore, NRC claimed that it had "acted reasonably in determining that its Regulations are practicable federal standards and should be implemented [everywhere] by November 8, 1981." Exhibit B at 29.[3]

NRC's position in the oversight hearings simply does not comport with its letters to the governors of Agreement States nor with its representation to the Court of Appeals for the Tenth Circuit. In view of the apparent conflict in NRC's position, it is essential for Congress to reaffirm that Agreement States have authority to reject NRC requirements on grounds of practicability without facing automatic termination of their regulatory authority.

2. Basis for NRC's 2 pCi/m2/sec. Standard. NRC's witness at the oversight hearing also evinced confusion as to whether the two picocurie per meter squared per second (2 pCi/m^2/sec.) standard for radon emissions from tailings pile was based on the assumptions that the government would fail and a house would be

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[2] These proceedings involve a challenge to NRC's mill tailings regulations.

[3] A copy of the Opposition is attached as Exhibit B. A copy of the original Motion for Stay is attached as Exhibit C.

built atop the tailings pile. Hubert Miller of NRC, who was one of those persons primarily responsible for the preparation of the Generic Enfironmental Impact Statement, confirmed that the 2 pCi/m^2-sec. standard was based in part on the assumption that the government would fail and that someone would build a house directly atop the tailings pile. *E.g.*, Transcript of Proceedings, New Mexico Radiation Technical Advisory Council Hearing, May 8, 1971, pp. 231-32.[4]

3. *The Benefits and Costs of NRC's Uranium Mill Licensing Regulations*. NRC's regulations establish a 2 pCi/m^2/sec. radon emission standard for uranium mill tailings. To assure compliance until at least the Year 3000, a *minimum* of 10 feet of soil must be placed over every tailings pile.

Examination of NRC's own projections, demonstrates that the incremental reduction in health risk as radon emissions are lowered from 100 to 2 pCi/m^2/sec. is negligible:[5]

Radon Level (pCi m2/sec)	Potential Health Effects	Incremental Reduction in Potential Health Effects
280 (no controls)	6.0	-
100	2.1	3.9
50	1.0	1.1
10	0.21	0.79
5	0.10	0.11
2	0.04	0.06

As shown by this table, reducing radon emissions from 50 to 2 pCi/m^2/sec. will reduce the potential health effects by 0.96 per year.

Incremental costs for compliance are also given by NRC:[6]

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[4] Pertinent portions of the transcript of this proceeding are attached as Exhibit D.

[5] This informatio appears in the Final General Environmental Impact Statement at Vol. I, Table 9.13 at pages 9-31.

[6] FGEIS at Vol. I, Table 12-5 at pages 12-22.

Flux Limit (pCi/m²-sec)	Total Industry Costs ($M)	100 Years		1,000 Years	
		Cumulative Health Effects Averted	Cost per Health Effects Averted ($M)	Cumulative Health Effects Averted	Cost per Health Effects Averted ($M)
100	45.5	386	0.316	3860	0.0316
10	215	579	3.51	5790	0.351
3	306	594	11.7	5940	1.17
2	336	596	17.6	5960	1.76
1	388	598	35.1	5980	3.51
0.1	562	600	351	6000	35.1

From this table, the cost per health effect averted at the 2 picocurie level is $17.6 million with a 100 year integration period.

Comparing the two tables, for a reduction from 10 to a 2 pCi/m^2/sec., the incremental reduction in potential health effects is 0.17, while the cost per health effect is increased over 400 per cent.

Moreover, the costs of compliance with the 2 pCi/m^2/sec. standard is substantially understated in NRC's calculations. As NRC has otherwise indicated, the costs of compliance with the 2 pCi/m^2/sec. standard will be no less than $760 million and could reach $1.5 billion.[7] Even these higher estimates are not complete as NRC has ignored important cost items. For example, NRC assumes that all of the soil necessary to cover every tailings pile, such as the 200 acre Kerr-McGee site in New Mexico, will be free.

Sincerely,

Larry A. Boggs
Senior Counsel

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[7] FGEIS, Vol. I at 3 and Table 12.1 at 12-8.

Exhibit A

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

MAR 16 1981

The Honorable Robert F. List
Governor of Nevada
Carson City, Nevada 89701

Dear Governor List:

On July 1, 1972, Nevada became an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended. Under the provisions of this Act, Nevada assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Nevada applied for and received a grant of $14,100 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Dr. Ralph DiSibio, Director, Nevada Department of Human Resources, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Dr. DiSibio and his staff and to identify remaining actions which Nevada must accomplish for a timely amended agreement.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission.

In response to our request for a statement of continuing interest to seek an amendment to the agreement, Dr. DiSibio supplied us in August with copies of legislation and proposed legislation authorizing regulation of mills and implementing regulations. These have been evaluated against criteria (Enclosure 1) developed for this purpose with Agreement State input.

The only deficiency we find in the legislation submitted is the lack of a provision for transfer of funds for long-term surveillance and maintenance to the Federal Government where the State elects not to take title to the land (Criterion 29c). Our comments on the regulations are contained in Enclosure 2.

Because Nevada does not have an active mill nor an imminent likelihood of an application, we understand that staffing to handle mill licensing and regulation has been deferred.

We cannot, however, complete a finding regarding Nevada's readiness for an amendment to its agreement unless all criteria have been met, including those for staffing. We suggest, therefore, that Nevada continue to work to put into place the necessary statutory and regulatory framework and define its organizational relationships, staff requirements and procedures.

In order that all parties can be aware of Nevada's intention to regulate mills and mill tailings in the event a mill is proposed in the State, we propose that if all criteria are met except for staffing, the following statement replace the effective date statement at the end of the enclosed proposed model amendment (Enclosure 3).

> This amendment to the Agreement shall become effective upon certification by the Governor to the Commission that the personnel meeting the specifications in the State's submissions dated _________ have entered on duty with the State and upon a subsequent finding by the Commission that these personnel meet the criteria and that the State program continues to meet the criteria.

We presume that the State will reliably know of forthcoming applications, will obtain the necessary staff and then request full implementation of the agreement.

While, in our opinion, Nevada has done much of the work necessary to the amendment, items outlined above need to be set forth. It will be mutually helpful to receive a timetable as early as possible outlining Nevada's actions to resolve all issues.

In this timetable, we suggest a target date of July 1, 1981 for formal submission by Nevada of the application for amendment.

We will continue to work with your staff toward an amended agreement. If you have any questions, please have your staff contact Mr. G. Wayne Kerr, Director of NRC's Office of State Programs, 301/492-8170.

Sincerely,

Original signed by

Joseph M. Hendrie
Chairman

Enclosures:
As stated

cc: Ralph DiSibio, Nevada, w/encls.
John Vaden, Nevada, w/encls.

NUCLEAR REGULATORY COMMISSION

Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Statement of Policy.

SUMMARY: The Nuclear Regulatory Commission has revised its statement of policy regarding criteria for guidance of States and NRC in discontinuance of NRC regulatory authority and assumption of regulatory authority by States through agreement. This action is necessary to make editorial changes to update the policy statement, to allow States to enter into agreements for low-level waste only, and to incorporate the provisions and requirements of the Uranium Mill Tailings Radiation Control Act of 1978. Adoption of this policy will allow interested States to enter into agreements with the NRC and regulate low-level waste sites only. Additionally, those States that meet the criteria for the regulation of uranium mills and tailings may exercise regulatory authority over these sources as provided by the Uranium Mill Tailings Radiation Control Act of 1978, as amended.

The revised statement of policy reflects the following principal changes:

1. Modification of Criterion 27 to allow a State to seek an agreement for the regulation of low-level waste as a separate category.

2. Inclusion of additional criteria for States wishing to continue regulating uranium and thorium processors and mill tailings after November 8, 1981.

3. Editorial and clarifying changes to make the statement current.

DATES: This policy statement is effective January 23, 1981.

FOR FURTHER INFORMATION CONTACT: John F. Kendig, Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone: 301-492-7767.

SUPPLEMENTARY INFORMATION:

1. These criteria were developed to implement a program, authorized by Pub. L. 86-373 which was enacted in the form of a new section to the Atomic Energy Act (Section 274) and approved by the President on September 23, 1959 and amended by Pub. L. 95-604 approved November 8, 1978. These criteria are intended to indicate factors which the Commission intends to consider in approving new or amended agreements. They are not intended to limit Commission discretion in viewing individual agreements or amendments. In accordance with these statutory provisions, when an agreement between a State and the NRC is effected, the Commission will discontinue its regulatory authority within that State over one or more of the following materials: byproduct material as defined in Section 11e(1) of the Act (radioisotopes), byproduct material as defined in Section 11e(2) of the Act (mill tailings or wastes), source material (uranium and thorium), special nuclear material (uranium 233, uranium 235 and plutonium) in quantities not sufficient to form a critical mass and permanent disposal of low-level waste containing one or more of the materials stated above but not including mill tailings.

2. An agreement may be effected between a State and NRC: (1) upon certification by the Governor that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement and the State desires to assume regulatory responsibility for such materials; and (2) after a finding by the Commission that the State program is in accordance with the requirements of subsection o of section 274 and in all other respects compatible with the Commission's program for the regulation of such materials, and is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement. It is also necessary that the State have enabling legislation authorizing its Governor to enter into such an agreement.

3. The original criteria were published on March 24, 1961 (26 FR 2537) after discussions with various State officials and other State representatives, to provide guidance and assistance to the States and the AEC (now NRC) in developing a regulatory program which would be compatible with that of the NRC. The criteria were circulated among States, Federal agencies, labor and industry, and other interested groups for comment.

4. The criteria require that the State authority consider the total accumulated occupational radiation exposure of individuals. To facilitate such an appoach, it is the view of the NRC that an overall radiation protection program is desirable. The maximum scope of

each State's radiation protection program is not, however, a necessary or appropriate subject for coverage in the criteria. Consequently, the criteria are silent on the question of whether a State should have a total regulatory program covering all sources of radiation, including those not subject to control by the NRC under the Atomic Energy Act, such as x-rays, radium, accelerators, etc.

5. These revised criteria provide for entering into an agreement for a separate category of materials, namely, low-level waste material in permanent disposal facilities. They also provide new criteria for States wishing to continue regulating uranium and thorium processing and the wastes resulting therefrom under the provisions of the Uranium Mill Tailings Radiation Control Act of 1978 (Pub. L. 95–604) after November 8, 1981. The revised criteria also contain a number of editorial changes such as changing AEC to NRC where appropriate to conform to present practice and law.

6. Inquiries about details of the criteria or other aspects of the NRC Federal-State Relations Program should be addressed to the Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Criteria [1]

Objectives

1. *Protection.* A State regulatory program shall be designed to protect the health and safety of the people against radiation hazards.

Radiation Protection Standards [2]

2. *Standards.* The State regulatory program shall adopt a set of standards for protection against radiation, which shall apply to byproduct, source and special nuclear materials in quantities not sufficient to form a critical mass.

3. *Uniformity in Radiation Standards.* It is important to strive for uniformity in technical definitions and terminology, particularly as related to such things as units of measurement and radiation dose. There shall be uniformity on maximum permissible doses and levels of radiation and concentrations of radioactivity, as fixed by Part 20 of the NRC regulations based on officially approved radiation protection guides.

4. *Total Occupational Radiation Exposure.* The regulatory authority shall consider the total occupational radiation exposure of individuals, including that from sources which are not regulated by it.

5. *Surveys, Monitoring.* Appropriate surveys and personnel monitoring under the close supervision of technically competent people are essential in achieving radiological protection and shall be made in determining compliance with safety regulations.

6. *Labels, Signs, Symbols.* It is desirable to achieve uniformity in labels, signs and symbols, and the posting thereof. However, it is essential that there be uniformity in labels, signs, and symbols affixed to radioactive products which are transferred from person to person.

7. *Instruction.* Persons working in or frequenting restricted areas [3] shall be instructed with respect to the health risks associated with exposure to radioactive materials and in precautions to minimize exposure. Workers shall have the right to request regulatory authority inspections as per 10 CFR 19, section 19.16 and to be represented during inspections as specified in section 19.14 of 10 CFR 19.

8. *Storage.* Licensed radioactive material in storage shall be secured against unauthorized removal.

9. *Waste Disposal.* The standards for the disposal of radioactive materials into the air, water, and sewers, and burial in the soil shall be in accordance with Part 20. Holders of radioactive material desiring to release or dispose of quantities in excess of the prescribed limits shall be required to obtain special permission from the appropriate regulatory authority.

10. *Regulations Governing Shipment of Radioactive Materials.* The State shall to the extent of its jurisdiction promulgate regulations applicable to the shipment of radioactive materials, such regulations to be compatible with those established by the U.S. Department of Transportation and other agencies of the United States whose jurisdiction over interstate shipment of such materials necessarily continues. State regulations regarding transportation of radioactive materials must be compatible with 10 CFR Part 71.

11. *Records and Reports.* The State regulatory program shall require that holders and users of radioactive materials (a) maintain records covering personnel radiation exposures, radiation surveys, and disposals of materials; (b) keep records of the receipt and transfer of the materials; (c) report significant incidents involving the materials, as prescribed by the regulatory authority; (d) make available upon request of a former employee a report of the employee's exposure to radiation; (e) at request of an employee advise the employee of his or her annual radiation exposure; and (f) inform each employee in writing when the employee has received radiation exposure in excess of the prescribed limits.

12. *Additional Requirements and Exemptions.* Consistent with the overall criteria here enumerated and to accommodate special cases or circumstances, the State regulatory authority shall be authorized in individual cases to impose additional requirements to protect health and safety, or to grant necessary exemptions which will not jeopardize health and safety.

Prior Evaluation of Uses of Radioactive Materials

13. *Prior Evaluation of Hazards and Uses, Exceptions.* In the present state of knowledge, it is necessary in regulating the possession and use of byproduct, source and special nuclear materials that the State regulatory authority require the submission of information on, and evaluation of, the potential hazards and the capability of the user or possessor prior to his receipt of the materials. This criterion is subject to certain exceptions and to continuing reappraisal as knowledge and experience in the atomic energy field increase. Frequently there are, and increasingly in the future there may be, categories of materials and uses as to which there is sufficient knowledge to permit possession and use without prior evaluation of the hazards and the capability of the possessor and user. These categories fall into two groups—those materials and uses which may be completely exempt from regulatory controls, and those materials and uses in which sanctions for misuse are maintained without pre-evaluation of the individual possession or use. In authorizing research and development or other activities involving multiple uses of radioactive materials, where an institution has people with extensive training and experience, the State regulatory authority may wish to provide a means for authorizing broad use of materials without evaluating each specific use.

14. *Evaluation Criteria.* In evaluating a proposal to use radioactive materials, the regulatory authority shall determine the adequacy of the applicant's facilities

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[1] The criteria were first adopted in February 1961 (26 FR 2537, March 24, 1961), and amended in November 1965 (30 FR 15044, December 4, 1965). Minor editorial changes were made in June 1968 to reflect the authority of the U.S. Department of Transportation and Organization change in NCRP.

[2] Suggested State regulations and State legislation will give content to all criteria enunciated.

[3] "Restricted area" means any area access to which is controlled by the licensee for the purpose of radiation protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include any area used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

and safety equipment, his training and experience in the use of the materials for the purpose requested, and his proposed administrative controls. States should develop guidance documents for use by license applicants. this guidance should be consistent with NRC licensing and regulatory guides for various categories of licensed activities.

15. *Human Use.* The use of radioactive materials and radiation on or in humans shall not be permitted except by properly qualified persons (normally licensed physicians) possessing prescribed minimum, experience in the use of radioisotopes or radiation.

Inspection

16. *Purpose, Frequency.* The possession and use of radioactive materials shall be subject to inspection by the regulatory authority and shall be subject to the performance of tests, as required by the regulatory authority. Inspection and testing is conducted to determine, and to assist in obtaining, compliance with regulatory requirements.

Freqency of inspection shall be related directly to the amount and kind of material and type of operation licensed, and it shall be adequate to insure compliance.

17. *Inspections Compulsory.* Licensees shall be under obligation by law to provide access to inspectors.

18. *Notification of Results of Inspection.* Licensees are entitled to be advised of the results of inspections and to notice as to whether or not they are in compliance.

Enforcement

19. *Enforcement.* Possession and use of radioactive materials should be amenable to enforcement through legal sanctions, and the regulatory authority shall be equipped or assisted by law with the necessary powers for prompt enforcement. This may include, as appropriate, administrative remedies looking toward issuance of orders requiring affirmative action or suspension or revocation of the right to possess and use materials, and the impounding of materials, the obtaining of injunctive relief, and the imposing of civil or criminal penalties.

Personnel

20. *Qualifications of Regulatory and Inspection Personnel.* The regulatory agency shall be staffed with sufficient trained personnel. Prior evaluation of applications for licenses or authorizations and inspection of licensees must be conducted by persons possessing the training and experience relevant to the type and level of radioactivity in the proposed use to be evaluated and inspected. This requires competency to evaluate various potential radiological hazards associated with the many uses of radioactive material and includes concentrations of radioactive materials in air and water, conditions of shielding, the making of radiation measurements, knowledge of radiation instruments—their selection, use and calibration—laboratory design, contamination control, other general principles and practices of radiation protection, and use of management controls in assuring adherence to safety procedures. In order to evaluate some complex cases, the State regulatory staff may need to be supplemented by consultants or other State agencies with expertise in geology, hydrology, water quality, radiobiology and engineering disciplines.

To perform the functions involved in evaluation and inspection, it is desirable that there be personnel educated and trained in the physical and/or life sciences, including biology, chemistry, physics and engineering, and that the personnel have had training and experience in radiation protection. For example, the person who will be responsible for the actual performance of evaluation and inspection of all of the various uses of byproduct, source and special nuclear material which might come to the regulatory body should have substantial training and extensive experience in the field of radiation protection. It is desirable that such a person have a bachelor's degree or equivalent in the physical or life sciences, and specific training-radiation protection.

It is recognized that there will also be persons in the program performing a more limited function in evaluation and inspection. These persons will perform the day-to-day work of the regulatory program and deal with both routine situations as well as some which will be out of the ordinary. These persons should have a bachelor's degree or equivalent in the physical or life sciences, training in health physics, and approximately two years of actual work experience in the field of radiation protection.

The foregoing are considered desirable qualifications for the staff who will be responsible for the actual performance of evaluation and inspection. In addition, there will probably be trainees associated with the regulatory program who will have an academic background in the physical or life sciences as well as varying amounts of specific training in radiation protection but little or no actual work experience in this field. The background and specific training of these persons will indicate to some extent their potential role in the regulatory program. These trainees, of course, could be used initially to evaluate and inspect those applications of radioactive materials which are considered routine or more standardized from the radiation safety standpoint, for example, inspection of industrial gauges, small research programs, and diagnostic medical programs. As they gain experience and competence in the field, trainees could be used progressively to deal with the more complex or difficult types of radioactive material applications. It is desirable that such trainees have a bachelor's degree or equivalent in the physical or life sciences and specific training in radiation protection. In determining the requirement for academic training of individuals in all of the foregoing categories proper consideration should be given to equivalent competency which has been gained by appropriate technical and radiation protection experience.

It is recognized that radioactive materials and their uses are so varied that the evaluation and inspection functions will require skills and experience in the different disciplines which will not always reside in one person. The regulatory authority should have the composite of such skills either in its employ or at its command, not only for routine functions, but also for emergency cases.

Special Nuclear Material, Source Material and Tritium

21. *Conditions Applicable to Special Nuclear Material, Source Material and Tritium.* Nothing in the State's regulatory program shall interfere with the duties imposed on the holder of the materials by the NRC, for example, the duty to report to the NRC, on NRC prescribed forms (1) transfers of special nuclear material, source material and tritium, and (2) periodic inventory data.

22. *Special Nuclear Material Defined.* Special nuclear material, in quantities not sufficient to form a critical mass, for present purposes means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium 233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of

such ratios for all of the kinds of special nuclear material in combination should not exceed "1" (i.e., unity). For example, the following quantities in combination would not exceed the limitation and are within the formula, as follows:

$$\frac{175 \text{ (grams contained U-235)}}{350} + \frac{50 \text{ (grams U-233)}}{200} + \frac{50 \text{ (grams Pu)}}{200} = 1$$

(This definition is subject to change by future Commission rule or regulation.)

Administration

23. State practices for assuring the fair and impartial administration of regulatory law, including provision for public participation where appropriate, should be incorporated in procedures for:

a. Formulation of rules of general applicability;

b. Approving or denying applications for licenses or authorization to possess and use radioactive materials, and

c. Taking disciplinary actions against licensees.

Arrangements For Discontinuing NRC Jurisdiction

24. *State Agency Designation.* The State should indicate which agency or agencies will have authority for carrying on the program and should provide the NRC with a summary of that legal authority. There should be assurances against duplicate regulation and licensing by State and local authorities, and it may be desirable that there be a single or central regulatory authority.

25. *Existing NRC Licenses and Pending Applications.* In effecting the discontinuance of jurisdiction, appropriate arrangements will be made by NRC and the State to ensure that there will be no interference with or interruption of licensed activities or the processing of license applications, by reason of the transfer. For example, one approach might be that the State, in assuming jurisdiction, could recognize and continue in effect, for an appropriate period of time under State law, existing NRC licenses, including licenses for which timely applications for renewal have been filed, except where good cause warrants the earlier reexamination or termination of the license.

26. *Relations With Federal Government and Other States.* There should be an interchange of Federal and State information and assistance in connection with the issuance of regulations and licenses or authorizations, inspection of licensees, reporting of incidents and violations, and training and education problems.

27. *Coverage, Amendments, Reciprocity.* An agreement providing for discontinuance of NRC regulatory authority and the assumption of regulatory authority by the State may relate to any one or more of the following categories of materials within the State, as contemplated by Public Law 86–373 and Public Law 95–604:

a. Byproduct materials as defined in section 11e(1) of the Act.

b. Byproduct materials as defined in section 11e(2) of the Act.

c. Source materials.

d. Special nuclear materials in quantities not sufficient to form a critical mass.

e. Low-level wastes in permanent disposal facilities, as defined by statute or Commission rules or regulations containing one or more of the materials stated in a, c, and d above but not including byproduct material as defined in Section 11e(2) of the Act;

but must relate to the whole of such category or categories and not to a part of any category.[9] If less than the five categories are included in any discontinuance of jurisdiction, discontinuance of NRC regulatory authority and the assumption of regulatory authority by the State of the others may be accomplished subsequently by an amendment or by a later agreement.

The agreement may incorporate by reference provisions of other documents, including these criteria, and the agreement shall be deemed to incorporate without specific reference the provisions of Pub. L. 86–373 and Pub. L. 95–604 and the related provisions of the Atomic Energy Act.

Arrangements should be made for the reciprocal recognition of State licenses and Federal licenses in connection with out-of-the-jurisdiction operations by a State or Federal licensee.

28. *NRC and Department of Energy Contractors.* The State should provide exemptions for NRC and DOE contractors which are substantially equivalent to the following exemptions:

a. Prime contractors performing work for the DOE at U.S. Government-owned or controlled sites;

b. Prime contractors performing research in, or development, manufacture, storage, testing, or transportation of, atomic weapons or components thereof;

c. Prime contractors using or operating nuclear reactors or other nuclear devices in a U.S. Government-owned vehicle or vessel; and

d. Any other prime contractor or subcontractor of DOE or NRC when the State and the NRC jointly determine (i) that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety and (ii) that the exemption of such contractor or subcontractor is authorized by law.

Additional Criteria for States Regulating Uranium or Thorium Processors and Wastes Resulting Therefrom After November 8, 1981

Statutes

29. State statutes or duly promulgated regulations should be enacted, if not already in place, to make clear State authority to carry out the requirements or Public Law 95–604, Uranium Mill Tailings Radiation Control Act (UMTRCA) as follows:

a. Authority to regulate the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

b. That an adequate surety (under terms established by regulation) will be provided by the licensee to assure the completion of all requirements established by the (cite appropriate State agency) for the decontamination, decommissioning, and reclamation of sites, structures, and equipment used in conjunction with the generation or disposal of such byproduct material.

c. If in the States' licensing and regulation of byproduct material or of any activity which produces byproduct material, the State collects funds from the licensee or its surety for long-term surveillance and maintenance of such material, the total amount of the funds collected by the State shall be transferred to the U.S. if custody of the byproduct material and its disposal site is transferred to the Federal Government upon termination of the State license. (See 10 CFR 150.32.) If no default has occurred and the reclamation or other bonded activity has been performed, funds for the purpose

are not to be transferred to the Federal Government. The funds collected by the State shall be sufficient to ensure compliance with the regulations the Commission establishes pursuant to Section 161X of the Atomic Energy Act.

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[9] A State which does not wish to continue regulation of uranium and thorium processors and byproduct material, as defined in Section 11e.(2) of the Atomic Energy Act as amended, after November 8, 1981 pursuant to Pub. L. 95–604 may obtain authority over all source material licenses within the State except for uranium or thorium processors.

d. In the issuances of licenses, an opportunity for written comments, public hearing (with transcript) and cross examination is required.

e. In the issuances of licenses, a written determination of the action to be taken based upon evidence presented during the public comment period and which is subject to judicial review is required.

f. A ban on major construction prior to completion of the aforementioned stipulations.

g. An opportunity shall be provided for public participation through written comments, public hearings, and judicial review of rules.

30. In the enactment of any supporting legislation, the State should take into account the reservations of authority to the U.S. in UMTRCA as stated in 10 CFR 150.15a and summarized by the following:

a. The establishment of minimum standards governing reclamation, long-term surveillance or maintenance, and ownership of the byproduct material.

b. The determination that prior to the termination of a license, the licensee has complied with decontamination, decommissioning and reclamation standards, and ownership requirements for sites at which byproduct material is present.

c. The requirement that prior to termination of any license for byproduct material, as defined in Section 11e.(2), of the Atomic Energy Act or for any activity that results in the production of such material, title to such byproduct material and the disposal site be transferred to the Federal Government or State at the option of the State, provided such option is exercised prior to termination of the license.

d. The authority to require such monitoring, maintenance, and emergency measures after the license is terminated as necessary to protect the public health and safety for those materials and property for which the State has assumed custody pursuant to Pub. L. 95-604.

e. The authority to permit use of the surface or subsurface estate, or both of the land transferred to the United States or State pursuant under provision of the Uranium Mill Radiation Tailings Control Act.

f. The authority to exempt land ownership transfer requirements of Section 83(b)(1)(A).

31. It is preferable that State statutes contain the provisions of Section 6 of the Model Act. But the following may be accomplished by adoption of either procedures by regulation or technical criteria. In any case, authority for their implementation should be adequately supported by statute, regulation or case law as determined by the State Attorney General.

In the licensing and regulation of ores processed primarily for their source material content and for the disposal of byproduct material, procedures shall be established which provide a written analysis of the impact on the environment of the licensing activity. This analysis shall be available to the public before commencement of hearings and shall include:[8]

a. An assessment of the radiological and nonradiological public health impacts;

b. An assessment of any impact on any body of water or groundwater;

c. Consideration of alternatives to the licensed activities; and

d. Consideration of long-term impacts of licensed activities (see Item 36b.(1).

Regulations

32. State regulations should be reviewed for regulatory requirements, and where necessary incorporate regulatory language which is equivalent to the extent practicable or more stringent than regulations and standards adopted and enforced by the Commission, as required by Section 274o (see 10 CFR 40 and 10 CFR 150.31(b)).

Organizational Relationships Within the States

33. Organizational relationships should be established which will provide for an effective regulatory program for uranium mills and mill tailings.

a. Charts should be developed which show the management organization and lines of authority. This chart should define the specific lines of supervision from program management within the radiation control group and any other department within the State responsible for contributing to the regulation of uranium processing and disposal of tailings. When other State agencies or regional offices are utilized, the lines of communication and administrative control between the agencies and/or regions and the Program Director should be clearly drawn.

b. Those States that will utilize personnel from other State Departments or Federal agencies in preparing the environmental assessment should designate a lead agency for supervising and coordinating preparation of this environmental assessment. It is normally expected that the radiation control agency in Agreement States will be the lead agency. The basic premise is that the lead agency is required to prepare the environmental assessment. Utilization of an applicant's environmental report in lieu of a lead agency assessment of the proposed project is not adequate or appropriate. However, the lead agency may prepare an environmental assessment based upon an applicant's environmental report. Other credible information may be utilized by the State as long as such information is verified and documented by the State.

c. When a lead agency is designated, that agency should coordinate preparation of the statement. The other agencies involved should provide assistance with respect to their areas of jurisdiction and expertise. Factors relevant in obtaining assistance from other agencies include the applicable statutory authority, the time sequence in which the agencies become involved, the magnitude of their involvement, and relative expertise with respect to the project's environmental effects.

In order to bring an environmental assessment to a satisfactory conclusion, it is highly recommended that an initial scoping document be developed which clearly delineates the area and scope of work to be performed by each agency, within a given time constraint.

d. For those areas in the environmental assessment where the State cannot identify a State agency having sufficient expertise to adequately evaluate the proposal or prepare an assessment, the State should have provisions for obtaining outside consulting services. In those instances where non-governmenatal consultants are utilized, procedures should be established to avoid conflict of interest consistent with State law and administrative procedures.

Medical consultants recognized for their expertise in emergency medical matters, such as the Oak Ridge and Hanford National Laboratories, relating to the intake or uranium and its diagnosis thereof associated with uranium mining and milling should be identified and available to the State for advice and direct assistance.

During the budget preparation, the State should allow for funding costs incurred by the use of consultants. In addition, consultants should be available for any emergencies which

may occur and for which their expertise would be needed immediately.

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[8] It is strongly recommended that a 30-day period be provided for public review.

Personnel

34. Personnel needed in the processing of the license application can be identified or grouped according to the following skills: Technical: Administrative: and Support.

a. Administrative personnel are those persons who will provide internal guides, policy memoranda, reviews and managerial services necessary to assure completion of the licensing action. Support personnel are those persons who provide secretarial, clerical support, legal, and laboratory services. Technical personnel are those individuals who have the training and experience in radiation protection necessary to evaluate the engineering and radiological safety aspects of a uranium concentrator. Current indications are that 2 to 2.75 total professional person years' effort is needed to process a new conventional mill license, in situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years effort for support and legal services should be one secretary for approximately 2 conventional mills and ½ staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory support services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activitives of UMTRCA.

b. In evaluating license applications the State shall have access to necessary specialities, e.g., radiological safety, hydrology, geology and dam construction and operation.

In addition to the personnel qualifications listed in the "Guide for Evaluation of State Radiation Control Programs," Revision 3, February 1, 1980, the regulatory staff involved in the regulatory process (Radiation) should have additional training in Uranium Mill Health Physics and Environmental Assessments.

c. Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers.

Functions To Be Covered

35. The States should develop procedures for licensing, inspection, and preparation of environmental assessments.

a. *Licensing*

(1) Licensing evaluations or assessments should include in-plant radiological safety aspects in occupational or restricted areas and environmental impacts to populations in unrestricted areas from the plant.

(2) It is expected that the State will review, evaluate and provide documentation of these evaluations. Items which should be evaluated are:

(a) Proposed activities;

(b) Scope of proposed action;

(c) Specific activities to be conducted;

(d) Administrative procedures;

(e) Facility organization and radiological safety responsibilities, authorities, and personnel qualifications;

(f) Licensee audits and inspections;

(g) Radiation safety training programs for workers;

(h) Radiation safety program, control and monitoring;

(i) Restricted area markings and access control;

(j) At existing mills, review of monitoring data, exposure records, licensee audit and inspection records, and other records applicable to existing mills;

(k) Environmental monitoring;

(l) Emergency procedures, radiological;

(m) Product transportation; and

(n) Site and physical decommissioning procedures, other than tailings.

(o) Employee exposure data and bioassay programs.

b. *Environmental Assessment*

(1) The environmental evaluation should consist of a detailed and documented evaluation of the following items:

(a) Topography;

(b) Geology;

(c) Hydrology and water quality;

(d) Meteorology;

(e) Background radiation;

(f) Tailings retention system;

(g) Interim stabilization, reclamation, and Site Decommissioning Program;

(h) Radiological Dose Assessment;

(1) Source terms

(2) Exposure pathway

(3) Dose commitment to individuals

(4) Dose commitment to populations

(5) Evaluation of radiological impacts to the public to include a determination of compliance with State and Federal regulations and comparisons with background values

(6) Occupational dose

(7) Radiological impact to biota other than man

(8) Radiological monitoring programs, pre-occupational and operational

(i) Impacts to surface and groundwater, both quality and quantity;

(j) Environmental effects of accidents; and

(k) Evaluation of tailings management alternatives in terms of regulations.

(2) The States are encouraged to examine the need to expand the scope of the assessment into other areas such as:

(a) Ecology;

(b) Environmental effects of site preparation and facility construction on environment and biota;

(c) Environmental effects of use and discharge of chemicals and fuels; and

(d) Economic and social effects.

c. *Inspections*

(1) As a minimum, items which should be inspected or included during the inspection of a uranium mill should adhere to the items evaluated in the in-plant safety review. The principal items recommended for inspection are:

(a) Administration;

(b) Mill circuit, including any additions, deletions, or circuit changes;

(c) Accidents/Incidents;

(d) Part 19 or equivalent requirements of the State;

(e) Action taken on previous findings;

(f) A mill tour to determine compliance with regulations, and license conditions;

(g) Tailings waste management in accordance with regulations and license conditions (see NRC Reg. Guide 3.11.1);

(h) Records;

(i) Respiratory protection in accordance with license conditions or 10 CFR Part 20.

(j) Effluent and environmental monitoring;

(k) Training programs;

(l) Transportation and shipping;

(m) Internal review and audit by management;

(n) Exit interview; and

(o) Final written report documenting the results of the inspection and findings on each item.

(2) In addition, the inspector should perform the following:

(a) Independent surveys and sampling.

(3) Additional guidance is contained in appropriate NRC regulatory and inspection guides. A *complete* inspection should be performed at least once per year.

d. *Operational Data Review*

(1) In addition to the reporting requirements required by the regulations or license conditions, the licensee will submit in writing to the regulatory agency within 60 days after January 1 and July 1 of each year, reports specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous six months of operation. This data shall be reported in a manner that will permit the regulatory agency to confirm the potential annual radiation doses to the public.

(2) All data from the radiological and non-radiological environmental monitoring program will also be submitted for the same time periods and frequency. The data will be reported in a manner that will allow the regulatory agency to conform the dose to receptors.

Instrumentation

36. The State should have available both field and laboratory instrumentation sufficient to ensure the licensee's control of materials and to validate the licensee's measurements.

a. The State will submit its list of instrumentation to the NRC for review. Arrangements should be made for calibrating such equipment.

b. Laboratory-type instrumentation should be available in a State agency or through a commercial service which has the capability for quantitative and qualitative analysis of radionuclides associated with natural uranium and its decay chain, primarily: U-238, Ra-226, Th-230, Pb-210, and Rn-222, in a variety of sample media such as will be encountered from an environmental sampling program.

Analysis and data reduction from laboratory analytical facilities should be available to the licensing and inspection authorities in a timely manner. Normally, the data should be available within 30 days of submittal. State acceptability of quality assurance (QA) programs should also be established for the analytical laboratories.

c. Arrangements should also be completed so that a large number of samples in a variety of sample media resulting from a major accident can be analyzed in a time frame that will allow timely decisions to be made regarding public health and safety.

d. Arrangements should be made to participate in the Environmental Protection Agency quality assurance program for laboratory performance.

Dated at Washington, D.C. this 19th day of January, 1981.

For the Nuclear Regulatory Commission.

John C. Hoyle,

Assistant Secretary of the Commission.

[FR Doc. 81-[illegible] Filed 1-22-81; 8:45 am]

BILLING CODE 7590-01-M

NEVADA

Regulations

The Nevada regulations do not cover all of the points in Appendix A, to 10 CFR 40 and 150.31(b) (which constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal under Atomic Energy Act (AEA) Section 274.o(2), as amended). While there are some limited technical requirements in the State regulations, (for example, Article 11 of the State's Regulations for Radiation Control), 10 CFR 40 Appendix A, Introduction, and Criteria 1-8 and and 11 and 12 are not covered. Financial surety arrangements (Criteria 9 and 11) and long-term funding requirements (Criterion 10) are addressed in the State's regulations; comments on these sections of the Nevada regulations are provided in later parts of this enclosure.

In connection with developing regulations, the State should recognize that Uranium Mill Tailings Radiation Control Act of 1978, as amended, (UMTRCA) states that duplication of proceedings conducted by the Commission is not necessary (last sentence of 274.o of AEA). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law.

It is also noted that UMTRCA requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable or more stringent than Commission regulations on uranium milling (10 CFR 150.31(b)(2)). The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS* which addressed operations in both Agreement and Non-Agreement States. The Commission regulations constitute minimum national standards.

Financial Surety

Article 11.4 of Nevada's Radiation Control regulations appears to contain adequate authority to require licensees to furnish financial assurances; however, it is stated that other unidentified financial arrangements (in addition to those specifically discussed) may be approved by the State. The regulation should clearly indicate that financial arrangements which constitute or provide no greater assurance than self-insurance will not be acceptable.

Section 11.4.5 of Nevada's regulations establishes a fixed amount ($2,600,000) of financial surety which must be provided for each licensed uranium recovery facility. Establishing such a fixed amount is wholly inappropriate since the costs for performing the required decommissioning, decontamination, and reclamation will vary significantly from site to site.

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*GEIS - Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706).

Regarding specific arrangements and terms of surety mechanisms, the regulations do not clearly indicate that the State intends to follow the standards established by the Commission as required.

Long-Term Surveillance and Monitoring

Section 11.2.1 of Nevada's regulations establishes a requirement for licensees to deposit monies to cover costs associated with long-term "care and maintenance" of tailings disposal sites. It appears that the Nevada regulations nowhere require efforts to eliminate the need for active, ongoing maintenance of sites over the long-term. This is a fundamental requirement of 10 CFR 40 Appendix A, Criteria 1 and 12, and is consistent with Section 161.x.(2)(A) of AEA, as amended. While there may be some uncertainty over the degree of ongoing surveillance that will be needed over the long-term, the clear thrust of legislation and regulations must be to require elimination of active maintenance (see also 12.3.11 and 14.3 of NUREG-0706). This concept should be explicitly stated in Nevada regulations so that the existence of the fund, established in Section 11.2.1, does not encourage programs which need ongoing, active maintenance (for example, this would include amending Section 11.2, which provides for the collection of monies to cover long-term maintenance, to make it clear that no active maintenance can be necessary over the long-term to preserve isolation).

The minimum charge associated with the escalating fee required by Criterion 10 of NRC's regulations will not be satisfied by the fund established in Section 11.2 of Nevada's regulations to provide for long-term site control. Nevada's regulations establish a levy per pound of product up to a maximum of $250,000. There is no indication that inflation, or other extenuating circumstances, will be considered in terms of adjusting the total amount charged each licensee for long-term site control.

Land Ownership

It appears that proposed new Section 459.041 of the Nevada legislation would contain adequate authority to require uranium recovery licensees to transfer title of tailings and disposal lands to a government agency. However, as with the other technical criteria, Nevada needs to issue specific regulations on this matter.

Enclosure 2.

MAR 13 1981

The Honorable Victor Atiyeh
Governor of Oregon
Salem, Oregon 97310

Dear Governor Atiyeh:

On July 1, 1965, Oregon became an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended. Under the provisions of this Act, Oregon assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided, for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Oregon applied for and received a grant of $47,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Mr. Lynn Frank, Director, Oregon Department of Energy, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Mr. Frank and his staff and to identify remaining actions which Oregon must accomplish for a timely amended agreement.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission.

As a result of information exchanged between the NRC and Oregon, in April, 1980, we provided Mr. Frank with our initial assessment of the readiness of Oregon for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1).

In a subsequent letter of July 22, 1980, to Mr. Frank, Mr. Robert G. Ryan added a request for documentation of organizational relationships, personnel and measurement capability.

Further detailed comments resulting from our review just completed are contained in Enclosure 2.

Because Oregon does not have an active mill nor an imminent likelihood of an application, we understand that staffing to handle mill licensing and regulation has been deferred.

We cannot, however, complete a finding regarding Oregon's readiness for an amendment to its agreement unless all criteria have been met, including those for staffing. We suggest, therefore, that Oregon continue to work to put into place the necessary framework and define its organizational relationships, staff requirements and procedures to meet the criteria.

In order that all parties can be aware of Oregon's intention to regulate mills and mill tailings in the event a mill is proposed in the State, we propose that if all criteria are met except for staffing the following statement replace the effective date statement at the end of the enclosed proposed model amendment (Enclosure 3):

> This amendment to the Agreement shall become effective upon certification by the Governor to the Commission that the personnel meeting the specifications in the State's submissions dated ____________ have entered on duty with the State and upon a subsequent finding by the Commission that these personnel meet the criteria and that the State program continues to meet the criteria.

We presume that the State will reliably know of forthcoming applications, will obtain the necessary staff and then request full implementation of the agreement.

While, in our opinion, Oregon has done much of the work necessary to the amendment, items outlined above need to be set forth. It will be mutually helpful to receive a timetable as early as possible outlining Oregon's actions to resolve all issues. In this timetable, we suggest a target date of July 1, 1981 for formal submission by Oregon of the application for amendment.

We will continue to work with your staff toward an amended agreement. If you have any questions, please have your staff contact Mr. G. Wayne Kerr, Director of NRC's Office of State Programs (301-492-8170).

Sincerely,

Original signed by

Joseph M. Hendrie
Chairman

Enclosures:
As stated

cc: Lynn Frank, Oregon, w/encls.
Don Godard, Oregon, w/encls.
Marshall Parrott, Oregon, w/encls.

OREGON

Regulations

It is noted that the Uranium Mill Tailings Radiation Control Act (UMTRCA) requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable, or more stringent than Commission regulations on uranium milling. The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS which addressed operations in both Agreement and non-Agreement States. The Commission regulations constitute minimum national standards (10 CFR §150.31).

In connection with this, the staff has reviewed Oregon's regulations. Although the State's regulations address many of the significant issues, they do not adequately cover all of the points in Appendix A to 10 CFR 40 and 10 CFR §150.31(b) (which, as indicated above, constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal). Comments on the specific provisions of the State's regulations in terms of their equivalency to minimum national standards are contained in later sections of this enclosure.

In connection with developing these regulations, the State should recognize that the UMTRCA states that duplication of proceedings conducted by the Commission is not necessary (last sentence of Section 274o of the AEA, as amended). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law. In fact, the simplest approach might be for the State to adopt language identical to that contained in the NRC regulations.

A detailed review of the Oregon regulations is attached.

Written Environmental Assessments

Oregon regulations contain no requirement for a written environmental analysis to be prepared by the State, as required by Section 274o(3)(c) of the Atomic Energy Act, as amended (AEA). Although Mr. Frank's January 30, 1980, letter to G. Wayne Kerr indicates that the Energy Facility Siting Council anticipates the preparation of a document reviewing the environmental impacts of a proposed uranium mill project, the requirement must be an explicit programmatic requirement. Such assessments should be prepared for all licensing actions having significant impact on the human environment, i.e., new licensing actions, renewals, and major amendments. All aspects of the assessment, required by AEA 274o(3)(c) (including those conducted by other State agencies), must be included in the documented analysis. Further, documented procedures should be provided which assure that this assessment will be made available for public review and comment some reasonable amount of time before proceedings on issuance of the license begin.

Pre-Licensing Construction

The Oregon regulations (ORS 469.320) permit on-site construction activity, prior to issuance of the State's environmental assessment, up to $250,000 and also provide for an exclusion of exploratory work. Such pre-licensing construction is prohibited by AEA, Section 274o(3((D) and 10 CFR 150.31(b)(3)(iii)(D).

ATTACHMENT

DETAILED REVIEW OF OREGON REGULATIONS IN TERMS OF APPENDIX A, 10 CFR 40

Our review was conducted by comparing the Oregon regulations with Appendix A, 10 CFR 40. A mark-up of Appendix A is included and each point which the State regulations must cover in an equivalent manner has been annotated ("A", "A-1", "B-1", etc.). The results of our review are summarized in the following table where we indicate those points that were adequately covered or not covered in the present Oregon regulations. Following the table, we have provided clarifying comments.

ANNOTATED POINTS OF APPENDIX A

Section	Not Covered Adequately	Covered	
Introduction	B, C	A	ORS-469.350 92-110[+]
Criterion 1	A, A-2, B, C, D	A-1 A-3	92-031(1) 92-031(2)
Criterion 2	A		
Criterion 3	A, C, D	B	92-031(2)
Criterion 4	A, B, C, C-1, C-2, C-3, E, F G, G-1, G-2, G-3, G-4, G-5, H, I, J, K*, L,	D*	95-120(4)
Criterion 5	B*, C-2, C-3, E, E-1, E-2, E-3, E-4, F, G, H, I, J, K, K-1, K-3, K-4, L	A C-1* D K-2 K-5 K-6	92-040(2) 95-120(6) 92-050 92-031(2) 92-031(2) 92-031(2)
Criterion 6	B, D, E, F	A C	95-120(2) 92-031(7)

[+] Section of the Oregon regulations where the identified item from NRC regulations is covered. Unless otherwise stated, the citation of Oregon regulations is in abbreviated form and applies to Section OAR-345 (for example, Section OAR-345-92-110 is cited as 92-110).

* Clarifying comments are made on this item following the table.

Section	Not Covered Adequately	Covered
Criterion 7	A*	B- 95-100
Criterion 8	B, C, C-1, C-2, C-3, C-4, C-5, C-6, D*, E*, F*	A 92-040(1) 95-070(5)
Criterion 8a		A 95-060(2) B 95-115
Criterion 9	D, E*, G, H, I, J, K	A-1, A-2, B-1 95-150(1) B-2, B-3, C* 95-150(1) F 95-150(4)
Criterion 10	A, B, C	
Criterion 11*	A, B, C, D, E	
Criterion 12	A, B, C	

CLARIFYING COMMENTS

Introduction:

None

Criterion 1:

None

Criterion 2:

None

Criterion 3:

None

Criterion 4:

1. Item D requires that during reclamation a full self sustaining vegetative cover be established or rock cover employed to reduce erosion to negligible levels. Although Section 95-120(4) of the

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* Clarifying comments are made on this item following the table.

Oregon regulations address this issue, it is recommended that the wording of this requirement be carefully considered since it may necessitate rip rap where this might not be necessary to control erosion.

2. Item K - Consideration of earthquake potential is addressed in the Oregon regulations, Section 92-031(8); however, the requirement needs to be more specific in terms of defining capable fault and maximum credible earthquake.

Criterion 5:

1. Item B indicates that any seepage which occurs does not result in the deterioration of existing groundwater supplies from their current or potential uses. Section 92-040(4) addresses water quality protection; however, it appears that protection is limited to drinking water supplies. It is necessary for the requirement to be more broad; i.e., prevent deterioration of any water supplies from their current or potential uses.

2. Item C-1 requires consideration of the installation of low permeability liners. It is recognized that this is addressed in Section 95-120(6) where it is required that all tailings disposal sites be lined with low permeability natural materials. It is recommended that the language of this requirement be carefully reviewed since it appears to prohibit the use of synthetic liners which may be adequate or superior in some situations.

Criterion 6:

None

Criterion 7:

1. Item A requires one full year of preoperational monitoring to collect baseline data. Section 95-100(1) of the Oregon regulations establishes a requirement for a monitoring program to be initiated at the conclusion of the preoperational program. Therefore, it is clearly intended that baseline environmental data will be collected during the preoperational stage; however, it is unclear how long this preoperational monitoring program must be conducted.

Criterion 8:

Items D, E, and F establish specific requirements for controlling dusting from diffuse large area sources. Although Sections 95-060(3) and 95-070(5) address this matter, the specific mitigating measures required, or required to be considered by Items D and E are not addressed. Further, there is no requirement, similar to Item F, that written operating procedures to control dusting be developed.

Criterion 8a:

None

Criterion 9:

1. Item C- requires that the surety cover the payment of the charge for long term surveillance and control. Section 95-150(1) requires a surety mechanism sufficient to provide for long term monitoring and maintenance (in addition to providing for decommissioning and reclamation. Although the provision for covering the long term surveillance charge is adequate, discussion of long term maintenance is inappropriate.

2. Item E - indicates that consolidated sureties would be acceptable only if the arrangements provide equivalent protection and the funds committed to mill decommissioning, reclamation and the provision of the long term charge are clearly identified. Although Section 95-150(4) permits consolidated sureties, the provisions under which they would be acceptable are not specified.

Criterion 10:

None

Criterion 11:

1. None of the specifics concerning the land ownership requirements of the Uranium Mill Tailings Radiation Control Act and Criterion 11 of 10 CFR 40 Appendix A are contained in the Oregon regulations. There appears to be adequate authority for the State to take custody of a tailings site, should it choose, and Section 95-150(2) seems to imply that land ownership transfer is being assumed by the State; however, no specific requirements for title transfer are contained in the State regulations.

Other Comments:

1. Section 95-120(1) discusses secondary dams and requires that they must be capable of containing the maximum quantity of tailings which would be released in the case of primary containment failure. It is stated elsewhere in the regulations (Section 95-040(7)) that all tailings dams shall be constructed in accordance with the procedures specified in USNRC Regulatory Guide 3.11. Therefore, it should be made clear in Section 95-120(1) that use of a secondary dam does not lead to a relaxation in the standards governing the design and construction integrity of the primary dam.

2. The NRC staff will review amended Oregon regulations to determine that the items identified in the above Table are fully covered in the amended regulations. However, in itemizing Appendix A Criteria as shown in Attachment 2, some of the "fine points" in the Appendix A Criteria are not brought out. The final wording of Appendix A criteria was carefully worked out after considering numerous public comments on the draft criteria (see Appendix A to NUREG-0706). As a result, in revising its regulations, the State should carefully consider the wording of each of the Appendix A Criteria noted as "covered" in the Table, and where different words are used in State regulations to determine that it is not significant. An example of this is Item A of Criterion 3. The definition of below grade is not included in Oregon regulations; this definition was added for clarification to NRC regulations following many comments on the matter in the draft NRC regulations.

Appendix A to Part 40

Criteria Relating to the Operation of Uranium Mills and the Disposition of Tailings or Wastes Produced by the Extraction or Concentration of Source Material From Ores Processed Primarily for Their Source Material Content.

Ⓐ Introduction. Every applicant for a license to possess and use source material in conjunction with uranium or thorium milling, or byproduct material at sites formerly associated with such milling, is required by the provisions of § 40.31(g) to include in a license application proposed specifications relating to milling operations and the disposition of tailings or waste resulting from such milling activities. This appendix establishes technical, financial, ownership, and long term site surveillance criteria relating to the siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at which such mills and systems are located. As used in this appendix, the term "as low as is reasonably achievable" has the same meaning as in paragraph 20.1(c) of 10 CFR 20 of this Chapter.

Ⓑ In many cases, flexibility is provided in the criteria to allow achieving an optimum tailings disposal program on a site specific basis. However, in such cases the objectives, technical alternatives, and concerns which must be taken into account in developing a tailings program are identified. As provided by the provisions of § 40.31(g), applications for licenses must clearly demonstrate how the criteria have been addressed.

Ⓒ The specifications shall be developed considering the expected full capacity of tailings or waste systems and the lifetime of mill operations. Where later expansions of systems or operations may be likely (for example, where large quantities of ore now marginally uneconomical may be stockpiled), the amendability of the disposal system to accommodate increased capacities without degradation in long term stability and other performance factors shall be evaluated.

Ⓓ Detailed programs meeting the technical and financial criteria in this Appendix, including appropriate supporting data, analyses, and alternatives, shall be developed by existing uranium milling licensees and filed with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, in connection with license renewal applications or within nine months from the effective date of this Appendix, whichever occurs first.

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GAO REPORTING REQUIREMENT
CLEARANCE IN JAN '81.

Attachment to Encl 2

I. Technical Criteria

(A) Criterion 1—In selecting among alternative tailings disposal sites or judging the adequacy of existing tailings sites, the following site features, which will determine the extent to which a program meets the broad objective of isolating the tailings and associated contaminants from man and the environment during operations and for thousands of years thereafter without ongoing active maintenance, shall be considered:

- (A-1) remoteness from populated areas;
- (A-2) hydrologic and other natural conditions as they contribute to continued immobilization and isolation of contaminants from usable groundwater sources; and
- (A-3) potential for minimizing erosion, disturbance, and dispersion by natural forces over the long term.

The site selection process shall be an optimization to the maximum extent reasonably achievable in terms of these features.

(B) In the selection of disposal sites, primary emphasis shall be given to isolation of tailings or wastes, a matter having long term impacts, as opposed to consideration only of short term convenience or benefits, such as minimization of transportation or land acquisition costs. (C) While isolation of tailings will be a function of both site and engineering design, overriding consideration shall be given to siting features given the long term nature of the tailings hazards.

(D) Tailings shall be disposed of in a manner that no active maintenance is required to preserve conditions of the site.

Criterion 2—To avoid proliferation of small waste disposal sites and thereby reduce perpetual surveillance obligations, byproduct material from in situ extraction operations, such as residues from solution evaporation or contaminated control processes, and wastes from small remote above ground extraction operations shall be disposed of at existing large mill tailings disposal sites; unless, considering the nature of the wastes, such as their volume and specific activity, and the costs and environmental impacts of transporting the wastes to a large disposal site, such offsite disposal is demonstrated to be impracticable or the advantages of onsite burial clearly outweigh the benefits of reducing the perpetual surveillance obligations.

RELATED CRITERIA

Ⓐ Criterion 3—The "prime option" for disposal of tailings is placement below grade, either in mines or specially excavated pits (that is, where the need for any specially constructed retention structure is eliminated).

Ⓑ The evaluation of alternative sites and disposal methods performed by mill operators in support of their proposed tailings disposal program (provided in applicants' environmental reports) shall reflect serious consideration of this disposal mode. In some instances, below grade disposal may not be the most environmentally sound approach, such as might be the case if a high quality groundwater formation is relatively close to the surface or not very well isolated by overlying soils and rock. Also, geologic and topographic conditions might make full below grade burial impracticable: for example, bedrock may be sufficiently near the surface that blasting would be required to excavate a disposal pit at excessive cost, and more suitable alternate sites are not available.

Ⓒ Where full below grade burial is not practicable, the size of retention structures, and size and steepness of slopes of associated exposed embankments shall be minimized by excavation to the maximum extent reasonably achievable or appropriate given the geologic and hydrologic conditions at a site.

Ⓓ In these cases, it must be demonstrated that an above grade disposal program will provide reasonably equivalent isolation of the tailings from natural erosional forces.

Criterion 4—The following site and design criteria shall be adhered to whether tailings or wastes are disposed of above or below grade.

Ⓐ (a) Upstream rainfall catchment areas must be minimized to decrease erosion potential and the size of the maximum possible flood which could erode or wash out sections of the tailings disposal area.

Ⓑ (b) Topographic features should provide good wind protection.

Ⓒ (c) Embankment and cover slopes shall be relatively flat after final stabilization to minimize erosion potential and to provide conservative factors of safety assuring long term stability.

(C-1) The broad objective should be to contour final slopes to grades which are as close as possible to those which would be provided if tailings were disposed of below grade; this could, for example, lead to slopes of about 10 horizontal to 1 vertical (10h:1v) or less steep.

(C-2) In general, slopes should not be steeper than about 5h:1v.

(C-3) Where steeper slopes are proposed, reasons why a slope less steep than 5h:1v would be impracticable should be provided, and compensating factors and conditions which make such slopes acceptable should be identified.

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CRITERION 4
CONTINUED NEXT PAGE

(D) (d) A full self-sustaining vegetative cover shall be established or rock cover employed to reduce wind and water erosion to negligible levels.

(E) Where a full vegetative cover is not likely to be self-sustaining due to climatic or other conditions, such as in semi-arid and arid regions, rock cover shall be employed on slopes of the impoundment system. (F) The NRC will consider relaxing this requirement for extremely gentle slopes such as those which may exist on the top of the pile.

(G) The following factors shall be considered in establishing the final rock cover design to avoid displacement of rock particles by human and animal traffic or by natural processes, and to preclude undercutting and piping:

- (G-1) shape, size, composition, and gradation of rock particles (excepting bedding material average particles size shall be at least cobble size or greater);
- (G-2) rock cover thickness and zoning of particles by size; and
- (G-3) steepness of underlying slopes.

(G-4) Individual rock fragments shall be dense, sound, and resistant to abrasion, and shall be free from cracks, seams, and other defects that would tend to unduly increase their destruction by water and frost actions. Weak, friable, or laminated aggregate shall not be used. Shale, rock laminated with shale, and cherts shall not be used.

(G-5) Rock covering of slopes may not be required where top covers are very thick (on the order of 10m or greater); impoundment slopes are very gentle (on the order of 10 h:1v or less); bulk cover materials have inherently favorable erosion resistance characteristics; and, there is negligible drainage catchment area upstream of the pile and good wind protection as described in points (a) and (b) of this Criterion.

(H) Furthermore, all impoundment surfaces shall be contoured to avoid areas of concentrated surface runoff or abrupt or sharp changes in slope gradient. (I) In addition to rock cover on slopes, areas toward which surface runoff might be directed shall be well protected with substantial rock cover (rip rap). (J) In addition to providing for stability of the impoundment system itself, overall stability, erosion potential, and geomorphology of surrounding terrain shall be evaluated to assure that there are not ongoing or potential processes, such as gully erosion, which would lead to impoundment instability.

(K) (e) The impoundment shall not be located near a capable fault that could cause a maximum credible earthquake larger than that which the impoundment could reasonably be expected to withstand. As used in this criterion, the term "capable fault" has the same meaning as defined in § III(g) of Appendix A of 10 CFR 100. The term "maximum credible earthquake" means that earthquake which would cause the maximum vibratory ground motion based upon an evaluation of earthquake potential considering the regional and local geology and seismology and specific characteristics of local subsurface material.

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(L) (f) The impoundment, where feasible, should be designed to incorporate features which will promote deposition. For example, design features which promote deposition of sediment suspended in any runoff which flows into the impoundment area might be utilized; the object of such a design feature would be to enhance the thickness of cover over time.

(A) Criterion 5—Steps shall be taken to reduce seepage of toxic materials into groundwater to the maximum extent reasonably achievable. (B) Any seepage which does occur shall not result in deterioration of existing groundwater supplies from their current or potential uses. The following shall be considered in order to accomplish this objective:

- (C-1) installation of low permeability bottom liners. (C-2) (Where synthetic liners are used, a leakage detection system shall be installed immediately below the liner to ensure major failures are detected if they occur. This is in addition to the groundwater monitoring program conducted as provided in Criterion 7. (C-3) Where clay liners are proposed or relatively thin in-situ clay soils are to be relied upon for seepage control, tests shall be conducted with representative tailings solutions and clay materials to confirm that no significant deterioration of permeability or stability properties will occur with continuous exposure of clay to tailings solutions. Tests shall be run for a sufficient period of time to reveal any effects if they are going to occur (in some cases, deterioration has been observed to occur rather rapidly after about nine months of exposure)).
- (D) mill process designs which provide the maximum practicable recycle of solutions and conservation of water to reduce the net input of liquid to the tailings impoundment.
- (E-1) dewatering of tailings by process devices and/or in-situ drainage systems. (At new sites, tailings shall be dewatered by a drainage system installed at the bottom of the impoundment to lower the phreatic surface and reduce the driving head for seepage, unless tests show tailings are not amenable to such a system. (E-2) Where in-situ dewatering is to be conducted, the impoundment bottom shall be graded to assure that the drains are at a low point. (E-3) The drains shall be protected by suitable filter materials to assure that drains remain free running. (E-4) The drainage system shall also be adequately sized to assure good drainage.).
- (F) neutralization to promote immobilization of toxic substances.

(G) Where groundwater impacts are occurring at an existing site due to seepage, action shall be taken to alleviate conditions that lead to excessive seepage impacts and restore groundwater quality to its potential use before milling operations began to the maximum extent practicable. The specific seepage control and groundwater protection method, or combination of methods, to be used must be worked out on a site-specific basis. (H) Technical specifications shall be prepared to control installation of seepage control systems. (I) A quality assurance, testing, and inspection program, which includes supervision by a qualified engineer or scientist, shall be established to assure the specifications are met.

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CRIT 5 - CONTINUED

[illegible]

(J) While the primary method of protecting groundwater shall be isolation of tailings tailings solutions, disposal involving conta with groundwater will be considered provided supporting tests and analyses are presented demonstrating that the proposed disposal and treatment methods will not degrade groundwater from current or potential uses.

(K) In support of a tailings disposal system proposal, the applicant/operator shall supply information concerning the following:

- (K-1) The chemical and radioactive characteristics of the waste solutions.
- (K2) The characteristics of the underlying soil and geologic formations particularly as they will control transport of contaminants and solutions. This shall include detailed information concerning extent, thickness, uniformity, shape, and orientation of underlying strata. Hydraulic gradients and conductivities of the various formations shall be determined.

(K-3) This information shall be gathered from borings and field survey methods taken within the proposed impoundment area and in surrounding areas where contaminants might migrate to usable groundwater. The information gathered on boreholes shall include both geologic and geophysical logs in sufficient number and degree of sophistication to allow determining significant discontinuities, fractures, and channeled deposits of high hydraulic conductivity. If field survey methods are used, they should be in addition to and calibrated with borehole logging. (K-4) Hydrologic parameters such as permeability shall not be determined on the basis of laboratory analysis of samples alone; a sufficient amount of field testing (e.g., pump tests) shall be conducted to assure actual field properties are adequately understood. (K-5) Testing shall be conducted to allow estimating chemi-sorption attenuation properties of underlying soil and rock.

- (K-6) Location, extent, quality, capacity and current uses of any groundwater at and near the site.

(L) Furthermore, steps shall be taken during stockpiling of ore to minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction of ore storage areas.

Ⓐ E-1 Criterion 6—Sufficient earth cover, but not less than three meters, shall be placed over tailings or wastes at the end of milling operations to result in a calculated reduction in surface exhalation of radon emanating from the tailings or wastes to less than two picocuries per square meter per second.

Ⓑ In computing required tailings cover thicknesses, moisture in soils in excess of amounts found normally in similar soils in similar circumstances shall not be considered.

Ⓒ Direct gamma exposure from the tailings or wastes should be reduced to background levels.

Ⓓ The effects of any thin synthetic layer shall not be taken into account in determining the calculated radon exhalation level.

Ⓔ E-2 If non-soiled materials are proposed to reduce tailings covers to less than three meters, it must be demonstrated that such materials will not crack or degrade by differential settlement, weathering, or other mechanism, over long term time intervals.

Ⓕ Near surface cover materials (i.e., within the top three meters) shall not include mine waste or rock that contains elevated levels of radium; soils used for near surface cover must be essentially the same, as far as radioactivity is concerned, as that of surrounding surface soils. This is to ensure that surface radon exhalation is not significantly above background because of the cover material itself.

CRITERIA 7 + 8A

(CRIT 8 - NEXT PAGE)

Ⓐ Criterion 7—At least one full year prior to any major site construction, a preoperational monitoring program shall be conducted to provide complete baseline data on a milling site and its environs.

Ⓑ Throughout the construction and operating phases of the mill, an operational monitoring program shall be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long term effects.

Ⓑ Criterion 8A—Daily inspections of tailings or waste retention systems shall be conducted by a qualified engineer or scientist and documented.

Ⓑ The appropriate NRC regional office as indicated in Appendix D of 10 CFR Part 20, or the Director, Office of Inspection and Enforcement, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, shall be immediately notified of any failure in a tailings or waste retention system which results in a release of tailings or waste into unrestricted areas, and/or of any unusual conditions (conditions not contemplated in the design of the retention system) which if not corrected could indicate the potential or lead to failure of the system and result in a release of tailings or waste into unrestricted areas.

(A) Criterion 8—Milling operations shall be conducted so that all airborne effluent releases are reduced to levels as low as is reasonably achievable. (B) The primary means of accomplishing this shall be by means of emission controls. Institutional controls, such as extending the site boundary and exclusion area, may be employed to ensure that offsite exposure limits are met, but only after all practicable measures have been taken to control emissions at the source. Notwithstanding the existence of individual dose standards, strict control of emissions is necessary to assure that population exposures are reduced to the maximum extent reasonably achievable and to avoid site contamination. The greatest potential sources of offsite radiation exposure (aside from radon exposure) are dusting from dry surfaces of the tailings disposal area not covered by tailings solution and emissions from yellowcake drying and packaging operations.

(C-1) Checks shall be made and logged hourly of all parameters (e.g., differential pressures and scrubber water flow rates) which determine the efficiency of yellowcake stack emission control equipment operation. (C-2) It shall be determined whether or not conditions are within a range prescribed to ensure that the equipment is operating consistently near peak efficiency; corrective action shall be taken when performance is outside of prescribed ranges. (C-3) Effluent control devices shall be operative at all times during drying and packaging operations and whenever air is exhausting from the yellowcake stack. (C-4) Drying and packaging operations shall terminate when controls are inoperative. (C-5) When checks indicate the equipment is not operating within the range prescribed for peak efficiency, actions shall be taken to restore parameters to the prescribed range. When this cannot be done without shutdown and repairs, drying and packaging operations shall cease as soon as practicable. Operations may not be re-started after cessation due to off-normal performance until needed corrective actions have been identified and implemented. (C-6) All such cessations, corrective actions, and re-starts shall be reported to the appropriate NRC regional office as indicated in Criterion 8A, in writing, within 10 days of the subsequent restart.

(D) To control dusting from tailings, that portion not covered by standing liquids shall be wetted or chemically stabilized to prevent or minimize blowing and dusting to the maximum extent reasonably achievable. This requirement may be relaxed if tailings are effectively sheltered from wind, such as may be the case where they are disposed of below grade and the tailings surface is not exposed to wind. (E) Consideration shall be given in planning tailings disposal programs to methods which would allow phased covering and reclamation of tailings impoundments since this will help in controlling particulate and radon emissions during operation. (F) To control dusting from diffuse sources, such as tailings and ore pads where automatic controls do not apply, operators shall develop written operating procedures specifying the methods of control which will be utilized.

prior to the commencement of operations to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the mill and site and for the reclamation of any tailings or waste disposal areas. The amount of funds to be ensured by such surety arrangements shall be based on Commission-approved cost estimates in a Commission-approved plan for (1) decontamination and decommissioning of mill buildings and the milling site to levels which would allow unrestricted use of these areas upon decommissioning, and (2) the reclamation of tailings and/or waste disposal areas in accordance with technical criteria delineated in Section I of this Appendix. The licensee shall submit this plan in conjunction with an environmental report that addresses the expected environmental impacts of the milling operation, decommissioning and tailings reclamation, and evaluates alternatives for mitigating these impacts. The surety shall also cover the payment of the charge for long term surveillance and control required by Criterion 10. In establishing specific surety arrangements, the licensee's cost estimates shall take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning and reclamation work. In order to avoid unnecessary duplication and expense, the Commission may accept financial sureties that have been consolidated with financial or surety arrangements established to meet requirements of other Federal or state agencies and/or local governing bodies for such decommissioning, decontamination, reclamation, and long term site surveillance and control, provided such arrangements are considered adequate to satisfy these requirements and that the portion of the surety which covers the decommissioning and reclamation of the mill, mill tailings site and associated areas, and the long term funding charge is clearly identified and committed for use in accomplishing these activities. The licensee's surety mechanism will be reviewed annually by the Commission to assure that sufficient funds would be available for completion of the reclamation plan if the work had to be performed by an independent contractor. The amount of surety liability should be adjusted to recognize any increases or decreases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of surety liability shall be retained until final compliance with the reclamation plan is determined. This will yield a surety that is at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal. The term of the surety mechanism must be open ended, unless it can be demonstrated that another arrangement would provide an equivalent level of assurance. This assurance could be provided with a surety instrument which is written for a specified period of time (e.g., five years) yet which must be automatically renewed unless the surety notifies the beneficiary (the Commission or the State regulatory agency) and the principal (the licensee) some reasonable time (e.g., 90 days) prior to the renewal date of their intention not to renew. In such a situation the surety requirement still exists and the licensee would be required to submit an acceptable replacement surety within a brief period of time to allow at least 60 days for the regulatory agency to collect.

(A)

(B-1)

(B-2)

(B)

(B-3)

(C)

(D)

(E)

(F)

(G)

(H)

(I)

→ CRIT 9 CONTINUED
NEXT PAGE

CRITERION 9 (CONTINUED) - CRITERION 10

(I)

Proof of forfeiture must not be necessary to collect the surety so that in the event that the licensee could not provide an acceptable replacement surety within the required time, the surety shall be automatically collected prior to its expiration. The conditions described above would have to be clearly stated on any surety instrument which is not open-ended, and must be agreed to by all parties.

(J)

Financial surety arrangements generally acceptable to the Commission are:

(a) Surety bonds;
(b) Cash deposits;
(c) Certificates of deposit;
(d) Deposits of government securities;
(e) Irrevocable letters or lines of credit; and
(f) Combinations of the above or such other types of arrangements as may be approved by the Commission.

(K)

However, self insurance, or any arrangement which essentially constitutes self insurance (e.g., a contract with a state or federal agency), will not satisfy the surety requirement since this provides no additional assurance other than that which already exists through license requirements.

(A)

Criterion 10—A minimum charge of $250,000 (1978 dollars) to cover the costs of long term surveillance shall be paid by each mill operator to the general treasury of the United States or to an appropriate State agency prior to the termination of a uranium or thorium mill license.

MINIMUM CHARGE OF MORE AS DETERMINED BY THE COMMISSION IN THE DETERMINATION MADE PURSUANT TO § 274(C)(4).

(B)

If site surveillance or control requirements at a particular site are determined, on the basis of a site-specific evaluation, to be significantly greater than those specified in Criterion 12, (e.g., if fencing is determined to be necessary) variance in funding requirements may be specified by the Commission. In any case, the total charge to cover the costs of long term surveillance shall be such that, with and assumed 1 percent annual real interest rate, the collected funds will yield interest in an amount sufficient to cover the annual costs of site surveillance.

(C)

The total charge will be adjusted annually prior to actual payment to recognize inflation. The inflation rate to be used is that indicated by the change in the Consumer Price Index published by the U.S. Department of Labor, Bureau of Labor Statistics.

Criterion 11—A. These criteria relating to ownership of tailings and their disposal sites become effective on November 8, 1981, and apply to all licenses terminated, issued, or renewed after that date.

Ⓐ

B. Any uranium or thorium milling license or tailings license shall contain such terms and conditions as the Commission determines necessary to assure that prior to termination of the license, the licensee will comply with ownership requirements of this criterion for sites used for tailings disposal.

Ⓑ

C. Title to the byproduct material licensed under this Part and land, including any interests therein (other than land owned by the United States or by a State) which is used for the disposal of any such byproduct material, or is essential to ensure the long term stability of such disposal site, shall be transferred to the United States or the State in which such land is located, at the option of such State. In view of the fact that physical isolation must be the primary means of long term control, and Government land ownership is a desirable supplementary measure, ownership of certain severable subsurface interests (for example, mineral rights) may be determined to be unnecessary to protect the public health and safety and the environment. In any case, however, the applicant/operator must demonstrate a serious effort to obtain such subsurface rights, and must, in the event that certain rights cannot be obtained, provide notification in local public land records of the fact that the land is being used for the disposal of radioactive material and is subject to either an NRC general or specific license prohibiting the disruption and disturbance of the tailings. In some rare cases, such as may occur with deep burial where no ongoing site surveillance will be required, surface land ownership transfer requirements may be waived. For licenses issued before November 8, 1981, the Commission may take into account the status of the ownership of such land, and interests therein, and the ability of a licensee to transfer title and custody thereof to the United States or a State.

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D. If the Commission subsequent to title transfer determines that use of the surface or subsurface estates, or both, of the land transferred to the United States or to a State will not endanger the public health, safety, welfare, or environment, the Commission may permit the use of the surface or subsurface estates, or both, of such land in a manner consistent with the provisions provided in these criteria. If the Commission permits such use of such land, it will provide the person who transferred such land with the right of first refusal with respect to such use of such land.

*

E. Material and land transferred to the United States or a State in accordance with this Criterion shall be transferred without cost to the United States or a State other than administrative and legal costs incurred in carrying out such transfer.

Ⓓ

F. The provisions of this Part respecting transfer of title and custody to land and tailings and wastes shall not apply in the case of lands held in trust by the United States for any Indian tribe or lands owned by such Indian tribe subject to a restriction against alienation imposed by the United States. In the case of such lands which are used for the disposal of byproduct material, as defined in this Part, the licensee shall enter into arrangements with the Commission as may be appropriate to assure the long term surveillance of such lands by the United States.

Ⓔ

IV. Long-Term Site Surveillance

Criterion 12—The final disposition of tailings or wastes at milling sites should be such that ongoing active maintenance is not necessary to preserve isolation.

Ⓐ

At a minimum, annual site inspections shall be conducted by the government agency retaining ultimate custody of the site where tailings, or wastes are stored to confirm the integrity of the stabilized tailings or waste systems and to determine the need, if any, for maintenance and/or monitoring.

Ⓑ

Results of the inspection shall be reported to the Commission within 60 days following each inspection. The Commission may require more frequent site inspections if, on the basis of a site-specific evaluation, such a need appears necessary due to the features of a particular tailings or waste disposal system.

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* RESERVED FEDERAL AUTHORITY (§ 83(b) OF ATOMIC ENERGY ACT)

AMENDMENT TO
AGREEMENT BETWEEN THE
UNITED STATES NUCLEAR REGULATORY COMMISSION
AND THE
STATE OF
FOR
DISCONTINUANCE OF CERTAIN COMMISSION REGULATORY AUTHORITY
AND
RESPONSIBILITY WITHIN THE STATE PURSUANT TO
SECTION 274 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED

WHEREAS, the United States Atomic Energy Commission[1] (hereinafter referred to as the Commission) entered into an Agreement (hereinafter referred to as the Agreement of (date)) with the State of   under section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act), which Agreement became effective on   and provided for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8, and Section 161 of the Act with respect to byproduct materials as defined in section 11e.(1) of the Act, source materials, and special nuclear materials in quantites not sufficient to form a critical mass; and

WHEREAS, it is necessary to enter into this amendment in order to implement new requirements of section 274 of the Act which become fully effective on November 8, 1981; and

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[1] Under the provisions of the Energy Reorganization Act of 1974, the regulatory functions formerly carried out by the Atomic Energy Commission are now carried out by the Nuclear Regulatory Commission as of January 19, 1975.

Encl. 3

WHEREAS, the Commission found on   that the program of the State for the regulation of materials covered by this amendment is in accordance with the requirements of section 274o. of the Act and in all other respects compatible with the Commission's program for the regulation of such materials and is adequate to protect the public health and safety; and

WHEREAS, this amendment is entered into pursuant to the provisions of the Atomic Energy Act of 1954, as amended;

NOW, THEREFORE, it is hereby agreed between the Commission and the Governor of the State, acting on behalf of the State, as follows:

Section 1. ARTICLE I of the Agreement of (date) is amended by adding "as defined in section 11e.(1) of the Act;" after the words "byproduct materials" in paragraph A., by redesignating paragraphs B. and C. as paragraphs C. and D., and by inserting the following new paragraph immediately after paragraph A.:

"B. Byproduct materials as defined in section 11e.(2) of the Act;".

Section 2. ARTICLE II of the Agreement of (date) is amended by inserting "A." before the words "This Agreement," by redesignating paragraphs A. through D. as subparagraphs 1. through 4., and by adding the following at the end thereof:

"B. Notwithstanding this Agreement, the Commission retains the following authorities pertaining to byproduct materials as defined in section 11e.(2) of the Act:

"1. Prior to the termination of a State license for such byproduct material, or for any activity that results in the production of such material, the Commission shall have made a determination that all applicable standards and requirements pertaining to such material have been met.

"2. The Commission reserves the authority to establish minimum standards governing reclamation, long term surveillance or maintenance, and ownership of such byproduct material. Such reserved authority includes:

"a. The authority to establish terms and conditions as the Commission determines necessary to assure that, prior to termination of any license for such byproduct material, or for any activity that results in the production of such material, the licensee shall comply with decontamination, decommissioning, and reclamation standards prescribed by the Commission; and with ownership requirements for such materials and its disposal site;

"b. The authority to require that prior to termination of any license for such byproduct material or for any activity that results in the production of such material, title to such byproduct material and its disposal site be transferred to the United States or the State at the option of the State (provided such option is exercised prior to termination of the license);

"c. The authority to permit use of surface or subsurface estates, or both, of the land transferred to the United States or the State pursuant to subparagraph B.2.b. of this Article;

"d. The authority to require the Secretary of the Department of Energy, other Federal agency, or State, whichever has custody of such byproduct material and its disposal site, to undertake such monitoring, maintenance, and emergency measures as are necessary to protect the public health and safety, and other actions as the Commission deems necessary; and

"e. The authority to enter into arrangements as may be appropriate to assure Federal long term surveillance or maintenance of such byproduct material and its disposal site on land held in trust by the United States for any Indian tribe or land owned by an Indian tribe and subject to a restriction against alienation imposed by the United States.".

Section 3. ARTICLE III of the Agreement of (date) is amended by inserting "otherwise licensable by the State under Article I of this Agreement" after the words "special nuclear material."

Section 4. ARTICLE VII of the Agreement of (date) is amended by inserting "all or part of" after the words "terminate or suspend," by inserting "(1)" after the words "finds that," and by adding at the end before the period the following:

", or (2) the State has not complied with one or more of the requirements of section 274 of the Act. The Commission shall periodically review this Agreement and actions taken by the State under this Agreement to ensure compliance with the provisions of section 274 of the Act.".

Section 5. ARTICLE VIII of the Agreement of (date) is amended by redesignating it Article IX and by inserting a new Article VIII as follows:

"In the licensing and regulation of byproduct material as defined in section 11e.(2) of the Act, or of any activity which results in production of such material, the State shall comply with the provisions of section 274o. of the Act. If, in such licensing and regulation, the State requires financial surety arrangements for the reclamation or long term surveillance or maintenance of such material,

"A. The total amount of funds the State collects for such purposes shall be transferred to the United States if custody of such material and its disposal site is transferred to the United States upon termination of the State license for such material or any activity which results in the production of such material. Such funds include, but are not limited to, sums collected for long term surveillance or maintenance. Such funds do not, however, include monies held as surety where no default has occurred and the reclamation or other bonded activity has been performed; and

"B. Such State surety or other financial requirements must be sufficient to ensure compliance with those standards established by the Commission pertaining to bonds, sureties, and financial arrangements to ensure adequate reclamation and long term management of such byproduct material and its disposal site.".

This amendment shall become effective on .

Done at , State of , in triplicate,

this day of .

FOR THE STATE OF

____

, Governor

Done at Washington, D.C., in triplicate, this day of .

FOR THE UNITED STATES NUCLEAR REGULATORY COMMISSION

____

AMENDED AGREEMENT BETWEEN
THE UNITED STATES ATOMIC ENERGY COMMISSION
AND THE STATE OF __________
FOR DISCONTINUANCE OF
CERTAIN COMMISSION REGULATORY AUTHORITY AND RESPONSIBILITY WITHIN THE STATE PURSUANT TO SECTION 274 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED

WHEREAS, The United States Atomic Energy Commission[1] (hereinafter referred to as the Commission) is authorized under Section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act) to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8 and Section 161 of the Act with respect to byproduct materials, source materials, and special nuclear materials in quantities not sufficient to form a critical mass; and

WHEREAS, The Governor of the State of __________ is authorized under to enter into this Agreement with the Commission; and

WHEREAS, The Governor of the State of __________ certified on that the State of ____________ (hereinafter referred to as the State) has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by this Agreement, and that the State desires to assume regulatory responsibility for such materials; and

WHEREAS, The Commission found on ______________ that the program of the State for the regulation of the materials covered by this Agreement is compatible with the Commission's program for the regulation of such materials and is adequate to protect the public health and safety; and[2]

WHEREAS, The State and the Commission recognize the desirability and importance of cooperation between the Commission and the State in the formulation of standards for protection against hazards of radiation and in assuring that State and Commission programs for protection against hazards of radiation will be coordinated and compatible; and

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[1] Under the provisions of the Energy Reorganization Act of 1974, the regulatory functions formerly carried out by the Atomic Energy Commission are now carried out by the Nuclear Regulatory Commission as of January 19, 1975.

[2] The amendment to this Agreement pertaining to byproduct material as defined in section 11e.(2) of the Act contained the following clause:

WHEREAS, the Commission found on ______________ that the program of the State for the regulation of materials covered by this amendment is in accordance with the requirements of section 274o. of the Act and in all other respects compatible with the Commission's program for the regulation of such materials and is adequate to protect the public health and safety;

WHEREAS, The Commission and the State recognize the desirability of reciprocal recognition of licenses and exemption from licensing of those materials subject to this Agreement; and

WHEREAS, This agreement is entered into pursuant to the provisions of the Atomic Energy Act of 1954, as amended;

NOW, THEREFORE, it is hereby agreed between the Commission and the Governor of the State, acting on behalf of the State, as follows:

ARTICLE I

Subject to the exceptions provided in Articles II, III, and IV, the Commission shall discontinue, as of the effective date of this Agreement, the regulatory authority of the Commission in the State under Chapters 6, 7, and 8, and Section 161 of the Act with respect to the following materials:

A. Byproduct materials as defined in section 11e.(1) of the Act;

B. Byproduct materials as defined in section 11e.(2) of the Act;

~~B.~~ C. Source materials; and

~~C.~~ D. Special nuclear materials in quantities not sufficient to form a critical mass.

ARTICLE II

A. This Agreement does not provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of:

~~A.~~ 1. The construction and operation of any production or utilization facility;

~~B.~~ 2. The export from or import into the United States of byproduct, source, or special nuclear material, or of any production or utilization facility;

~~C.~~ 3. The disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;

~~D~~ 4. The disposal of such other byproduct, source, or special nuclear material as the Commission from time to time determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

B. Notwithstanding this Agreement, the Commission retains the following authorities pertaining to byproduct materials as defined in section 11e.(2) of the Act:

1. Prior to the termination of a State license for such byproduct material, or for any activity that results in the production of such material, the Commission shall have made a determination that all applicable standards and requirements pertaining to such material have been met.

2. The Commission reserves the authority to establish minimum standards governing reclamation, long term surveillance or maintenance, and ownership of such byproduct material. Such reserved authority includes:

   a. The authority to establish terms and conditions as the Commission determines necessary to assure that, prior to termination of any license for such byproduct material, or for any activity that results in the production of such material, the licensee shall comply with decontamination, decommissioning, and reclamation standards prescribed by the Commission; and with ownership requirements for such materials and its disposal site;

   b. The authority to require that prior to termination of any license for such byproduct material or for any activity that results in the production of such material, title to such byproduct material and its disposal site be transferred to the United States or the State at the option of the State (provided such option is exercised prior to termination of the license);

   c. The authority to permit use of surface or subsurface estates, or both, of the land transferred to the United States or the State pursuant to subparagraph B.2.b of of this Article;

   d. The authority to require the Secretary of the Department of Energy, other Federal agency, or State, whichever has custody of such byproduct material and its disposal site, to undertake such monitoring, maintenance, and emergency measures as are necessary to protect the public health and safety, and other actions as the Commission deems necessary; and

   e. The authority to enter into arrangements as may be appropriate to assure Federal long term surveillance or maintenance of such byproduct material and its disposal site on land held in trust by the United States for any Indian tribe or land owned by an Indian tribe and subject to a restriction against alienation imposed by the United States.

ARTICLE III

Notwithstanding this Agreement, the Commission may from time to time by rule, regulation, or order, require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material otherwise licensable by the State under Article I of this Agreement shall not transfer possession or control of such product except pursuant to a license or an exemption from licensing issued by the Commission.

ARTICLE IV

This Agreement shall not affect the authority of the Commission under subsection 161 b. or i. of the Act to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material.

ARTICLE V

The Commission will use its best efforts to cooperate with the State and other agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible. The State will use its best efforts to cooperate with the Commission and other agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that the State's program will continue to be compatible with the program of the Commission for the regulation of like materials. The State and the Commission will use their best efforts to keep each other informed of proposed changes in their respective rules and regulations and licensing, inspection and enforcement policies and criteria, and to obtain the comments and assistance of the other party thereon.

ARTICLE VI

The Commission and the State agree that it is desirable to provide for reciprocal recognition of licenses for the materials listed in Article I licensed by the other party or by any agreement state. Accordingly, the Commission and the State agree to use their best efforts to develop appropriate rules, regualtions, and procedures by which such reciprocity will be accorded.

ARTICLE VII

The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State, or upon request of the Governor of the State, may terminate or suspend all or part of this Agreement and reassert the licensing and regulatory authority vested in it under the

Act if the Commission finds that (1) such termination or suspension is required to protect the public health and safety, or (2) the State has not complied with one or more of the requirements of section 274 of the Act. The Commission shall periodically review this Agreement and actions taken by the State under this Agreement to ensure compliance with provisions of section 274 of the Act.

ARTICLE VIII

In the licensing and regulation of byproduct material as defined in section 11e.(2) of the Act, or of any activity which results in production of such material, the State shall comply with the provisions of section 274o. of the Act. If, in such licensing and regulation, the State requires financial surety arrangements for the reclamation or long term surveillance or maintenance of such material,

A. The total amount of funds the State collects for such purposes shall be transferred to the United States if custody of such material and its disposal site is transferred to the United States upon termination of the State license for such material or any activity which results in the production of such material. Such funds include, but are not limited to, sums collected for long term surveillance or maintenance. Such funds do not, however, include monies held as surety where no default has occurred and the reclamation or other bonded activity has been performed; and

B. Such State surety or other financial requirements must be sufficient to ensure compliance with those standards established by the Commission pertaining to bonds, sureties, and financial arrangements to ensure adequate reclamation and long term management of such byproduct material and its disposal site.

ARTICLE IX

This Agreement shall become effective on ____________ and shall remain in effect unless and until such time as it is terminated pursuant to Article VII.

Done at __________ State of __________ in triplicate, this __________ day of ______________.[3]

FOR THE UNITED STATES ATOMIC
ENERGY COMMISSION

____

FOR THE STATE OF ____________

____

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[3] The amendment to this Agreement pertaining to byproduct material as defined in section 11e.(2) of the Act became effective on   . It was signed at   , State of   , in triplicate on   by   for the State of, and signed at Washington, D.C., in triplicate, on   by   for the United States Nuclear Regulatory Commission.

MAR 17 1981

The Honorable Edmund G. Brown, Jr.
Governor of California
Sacramento, California 95814

Dear Governor Brown:

California became an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended, when an agreement between the Atomic Energy Commission (now the NRC) and the State became effective on September 1, 1962. Under the provisions of this Act, California assumed certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 1981, by entering into an amended agreement with the NRC.

In UMTRCA, the Congress provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. California applied for and received a grant of $50,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority. Thus, on the continuing presumption that California does wish to have authority for the regulation of mills and mill tailings whenever they are established within the State, it is necessary that the present agreement between AEC (now NRC) and the State be amended. (See Enclosure 1 for proposed amendment). Before it can be amended, we must review California's regulatory program as it relates to mills and mill tailings.

In the summer of 1980, we began an early review of current and potential uranium mill Agreement State programs to provide an early indication of where each State stands in preparing to enter into amended agreements. On July 31, 1980, we wrote to Ms. Beverlee Myers, Director, Health Services, and reported our initial assessment of the California program for regulating uranium mills and mill tailings with respect to the NRC criteria. On September 19, 1980, Mr. Ward, Chief, Radiologic Health Section, furnished us additional information in response to our assessment. Included in this response is reference to State comments on statutes to be transmitted to us at a later date. At this time we have not received such comments, although with the information provided, we have reassessed the California program. Our findings include an analysis (Enclosure 2) of the California Health and Safety Code as it applies to uranium milling regulation which identifies specific issues needing resolution.

We note that California has not enacted statutes nor promulgated regulations specific to uranium mills and mill tailings. In order to provide a basis for moving to amend the agreement, the State must adopt statutory and regulatory language which satisfies the following requirements:

1. The UMTRCA of 1978, as amended;
2. 10 CFR 40 Appendix A and 10 CFR 150; and
3. Recently published Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement (Enclosure 3).

We cannot, however, complete a finding regarding California's readiness for an amendment to its agreement unless all criteria have been met, including those for staffing. We suggest, therefore, that California continue to work to put into place the necessary framework and define its organizational relationships, staff requirements, and procedures to meet the requirements.

It will be helpful to receive a timetable outlining California's actions to resolve these issues. We suggest a target date of July 1, 1981 for formal submission by California of the application for amendment.

Since California does not have an active mill nor an imminent likelihood of an application, we understand that staffing to handle mill licensing and regulation has been deferred by the State. In order that all parties can be aware of California's intention to regulate mills and mill tailings in the event a mill is proposed in the State, we propose that if all criteria are met except for staffing, the following statement replace the effective date statement at the end of the enclosed proposed model amendment:

> This amendment to the Agreement shall become effective upon certification by the Governor to the Commission that the personnel meeting the specifications in the State's submissions dated _____________ have entered on duty with the State and upon a subsequent finding by the Commission that these personnel meet the criteria and that the State program continues to meet the criteria.

We presume that the State will reliably know of forthcoming applications, will obtain the necessary staff, and then request full implementation of the agreement.

In our opinion, California has much work that needs to be done in order to achieve success in moving towards entering into an amended agreement with NRC and meeting said requirements. We need to know at an early date how the State plans to complete its actions in this matter. If you have any questions, please have your staff contact Mr. G. Wayne Kerr, Director of NRC's Office of State Programs (301-492-8170).

Sincerely,

Original Signed By
Joseph M. Hendrie

Joseph M. Hendrie
Chairman

Enclosures:
As stated

cc: M. Obledo, California, w/encls.
B. Myers, California, w/encls.
J. Ward, California, w/encls.

AMENDMENT TO
AGREEMENT BETWEEN THE
UNITED STATES NUCLEAR REGULATORY COMMISSION
AND THE
STATE OF
FOR
DISCONTINUANCE OF CERTAIN COMMISSION REGULATORY AUTHORITY
AND
RESPONSIBILITY WITHIN THE STATE PURSUANT TO
SECTION 274 OF THE ATOMIC ENERGY ACT OF 1954, AS AMENDED

WHEREAS, the United States Atomic Energy Commission[1/] (hereinafter referred to as the Commission) entered into an Agreement (hereinafter referred to as the Agreement of (date)) with the State of under section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act), which Agreement became effective on and provided for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8, and Section 161 of the Act with respect to byproduct materials as defined in section 11e.(1) of the Act, source materials, and special nuclear materials in quantites not sufficient to form a critical mass; and

WHEREAS, it is necessary to enter into this amendment in order to implement new requirements of section 274 of the Act which become fully effective on November 8, 1981; and

---

[1/] Under the provisions of the Energy Reorganization Act of 1974, the regulatory functions formerly carried out by the Atomic Energy Commission are now carried out by the Nuclear Regulatory Commission as of January 19, 1975.

Encl. 1

WHEREAS, the Commission found on   that the program of the State for the regulation of materials covered by this amendment is in accordance with the requirements of section 274o. of the Act and in all other respects compatible with the Commission's program for the regulation of such materials and is adequate to protect the public health and safety; and

WHEREAS, this amendment is entered into pursuant to the provisions of the Atomic Energy Act of 1954, as amended;

NOW, THEREFORE, it is hereby agreed between the Commission and the Governor of the State, acting on behalf of the State, as follows:

Section 1. ARTICLE I of the Agreement of (date) is amended by adding "as defined in section 11e.(1) of the Act;" after the words "byproduct materials" in paragraph A., by redesignating paragraphs B. and C. as paragraphs C. and D., and by inserting the following new paragraph immediately after paragraph A.:

"B. Byproduct materials as defined in section 11e.(2) of the Act;".

Section 2. ARTICLE II of the Agreement of (date) is amended by inserting "A." before the words "This Agreement," by redesignating paragraphs A. through D. as subparagraphs 1. through 4., and by adding the following at the end thereof:

"B. Notwithstanding this Agreement, the Commission retains the following authorities pertaining to byproduct materials as defined in section 11e.(2) of the Act:

"1. Prior to the termination of a State license for such byproduct material, or for any activity that results in the production of such material, the Commission shall have made a determination that all applicable standards and requirements pertaining to such material have been met.

"2. The Commission reserves the authority to establish minimum standards governing reclamation, long term surveillance or maintenance, and ownership of such byproduct material. Such reserved authority includes:

"a. The authority to establish terms and conditions as the Commission determines necessary to assure that, prior to termination of any license for such byproduct material, or for any activity that results in the production of such material, the licensee shall comply with decontamination, decommissioning, and reclamation standards prescribed by the Commission; and with ownership requirements for such materials and its disposal site;

"b. The authority to require that prior to termination of any license for such byproduct material or for any activity that results in the production of such material, title to such byproduct material and its disposal site be transferred to the United States or the State at the option of the State (provided such option is exercised prior to termination of the license);

"c. The authority to permit use of surface or subsurface estates, or both, of the land transferred to the United States or the State pursuant to subparagraph B.2.b. of this Article;

"d. The authority to require the Secretary of the Department of Energy, other Federal agency, or State, whichever has custody of such byproduct material and its disposal site, to undertake such monitoring, maintenance, and emergency measures as are necessary to protect the public health and safety, and other actions as the Commission deems necessary; and

"e. The authority to enter into arrangements as may be appropriate to assure Federal long term surveillance or maintenance of such byproduct material and its disposal site on land held in trust by the United States for any Indian tribe or land owned by an Indian tribe and subject to a restriction against alienation imposed by the United States.".

Section 3. ARTICLE III of the Agreement of (date) is amended by inserting "otherwise licensable by the State under Article I of this Agreement" after the words "special nuclear material."

Section 4. ARTICLE VII of the Agreement of (date) is amended by inserting "all or part of" after the words "terminate or suspend," by inserting "(1)" after the words "finds that," and by adding at the end before the period the following:

", or (2) the State has not complied with one or more of the requirements of section 274 of the Act. The Commission shall periodically review this Agreement and actions taken by the State under this Agreement to ensure compliance with the provisions of section 274 of the Act.".

Section 5. ARTICLE VIII of the Agreement of (date) is amended by redesignating it Article IX and by inserting a new Article VIII as follows:

"In the licensing and regulation of byproduct material as defined in section 11e.(2) of the Act, or of any activity which results in production of such material, the State shall comply with the provisions of section 274o. of the Act. If, in such licensing and regulation, the State requires financial surety arrangements for the reclamation or long term surveillance or maintenance of such material,

"A. The total amount of funds the State collects for such purposes shall be transferred to the United States if custody of such material and its disposal site is transferred to the United States upon termination of the State license for such material or any activity which results in the production of such material. Such funds include, but are not limited to, sums collected for long term surveillance or maintenance. Such funds do not, however, include monies held as surety where no default has occurred and the reclamation or other bonded activity has been performed; and

"B. Such State surety or other financial requirements must be sufficient to ensure compliance with those standards established by the Commission pertaining to bonds, sureties, and financial arrangements to ensure adequate reclamation and long term management of such byproduct material and its disposal site.".

This amendment shall become effective on .

Done at , State of , in triplicate,

this day of .

FOR THE STATE OF

____

, Governor

Done at Washington, D.C., in triplicate, this day of .

FOR THE UNITED STATES NUCLEAR REGULATORY COMMISSION

____

AMENDED AGREEMENT BETWEEN
THE UNITED STATES ATOMIC ENERGY COMMISSION
AND THE STATE OF ________
FOR DISCONTINUANCE OF
CERTAIN COMMISSION REGULATORY AUTHORITY AND RESPONSIBILITY
WITHIN THE STATE PURSUANT TO SECTION 274 OF THE
ATOMIC ENERGY ACT OF 1954, AS AMENDED

WHEREAS, The United States Atomic Energy Commission[1] (hereinafter referred to as the Commission) is authorized under Section 274 of the Atomic Energy Act of 1954, as amended (hereinafter referred to as the Act) to enter into agreements with the Governor of any State providing for discontinuance of the regulatory authority of the Commission within the State under Chapters 6, 7, and 8 and Section 161 of the Act with respect to byproduct materials, source materials, and special nuclear materials in quantities not sufficient to form a critical mass; and

WHEREAS, The Governor of the State of _________ is authorized under to enter into this Agreement with the Commission; and

WHEREAS, The Governor of the State of _________ certified on that the State of ___________ (hereinafter referred to as the State) has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by this Agreement, and that the State desires to assume regulatory responsibility for such materials; and

WHEREAS, The Commission found on _____________ that the program of the State for the regulation of the materials covered by this Agreement is compatible with the Commission's program for the regulation of such materials and is adequate to protect the public health and safety; and[2]

WHEREAS, The State and the Commission recognize the desirability and importance of cooperation between the Commission and the State in the formulation of standards for protection against hazards of radiation and in assuring that State and Commission programs for protection against hazards of radiation will be coordinated and compatible; and

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[1] Under the provisions of the Energy Reorganization Act of 1974, the regulatory functions formerly carried out by the Atomic Energy Commission are now carried out by the Nuclear Regulatory Commission as of January 19, 1975.

[2] The amendment to this Agreement pertaining to byproduct material as defined in section 11e.(2) of the Act contained the following clause:

WHEREAS, the Commission found on _______________ that the program of the State for the regulation of materials covered by this amendment is in accordance with the requirements of section 274o. of the Act and in all other respects compatible with the Commission's program for the regulation of such materials and is adequate to protect the public health and safety;

WHEREAS, The Commission and the State recognize the desirability of reciprocal recognition of licenses and exemption from licensing of those materials subject to this Agreement; and

WHEREAS, This agreement is entered into pursuant to the provisions of the Atomic Energy Act of 1954, as amended;

NOW, THEREFORE, it is hereby agreed between the Commission and the Governor of the State, acting on behalf of the State, as follows:

ARTICLE I

Subject to the exceptions provided in Articles II, III, and IV, the Commission shall discontinue, as of the effective date of this Agreement, the regulatory authority of the Commission in the State under Chapters 6, 7, and 8, and Section 161 of the Act with respect to the following materials:

A. Byproduct materials as defined in section 11e.(1) of the Act;

B. Byproduct materials as defined in section 11e.(2) of the Act;

~~B.~~ C. Source materials; and

~~C.~~ D. Special nuclear materials in quantities not sufficient to form a critical mass.

ARTICLE II

A. This Agreement does not provide for discontinuance of any authority and the Commission shall retain authority and responsibility with respect to regulation of:

~~A.~~ 1. The construction and operation of any production or utilization facility;

~~B.~~ 2. The export from or import into the United States of byproduct, source, or special nuclear material, or of any production or utilization facility;

~~C.~~ 3. The disposal into the ocean or sea of byproduct, source, or special nuclear waste materials as defined in regulations or orders of the Commission;

~~D.~~ 4. The disposal of such other byproduct, source, or special nuclear material as the Commission from time to time determines by regulation or order should, because of the hazards or potential hazards thereof, not be so disposed of without a license from the Commission.

B. Notwithstanding this Agreement, the Commission retains the following authorities pertaining to byproduct materials as defined in section 11e.(2) of the Act:

1. Prior to the termination of a State license for such byproduct material, or for any activity that results in the production of such material, the Commission shall have made a determination that all applicable standards and requirements pertaining to such material have been met.

2. The Commission reserves the authority to establish minimum standards governing reclamation, long term surveillance or maintenance, and ownership of such byproduct material. Such reserved authority includes:

   a. The authority to establish terms and conditions as the Commission determines necessary to assure that, prior to termination of any license for such byproduct material, or for any activity that results in the production of such material, the licensee shall comply with decontamination, decommissioning, and reclamation standards prescribed by the Commission; and with ownership requirements for such materials and its disposal site;

   b. The authority to require that prior to termination of any license for such byproduct material or for any activity that results in the production of such material, title to such byproduct material and its disposal site be transferred to the United States or the State at the option of the State (provided such option is exercised prior to termination of the license);

   c. The authority to permit use of surface or subsurface estates, or both, of the land transferred to the United States or the State pursuant to subparagraph B.2.b of this Article;

   d. The authority to require the Secretary of the Department of Energy, other Federal agency, or State, whichever has custody of such byproduct material and its disposal site, to undertake such monitoring, maintenance, and emergency measures as are necessary to protect the public health and safety, and other actions as the Commission deems necessary; and

   e. The authority to enter into arrangements as may be appropriate to assure Federal long term surveillance or maintenance of such byproduct material and its disposal site on land held in trust by the United States for any Indian tribe or land owned by an Indian tribe and subject to a restriction against alienation imposed by the United States.

ARTICLE III

Notwithstanding this Agreement, the Commission may from time to time by rule, regulation, or order, require that the manufacturer, processor, or producer of any equipment, device, commodity, or other product containing source, byproduct, or special nuclear material otherwise licensable by the State under Article I of this Agreement shall not transfer possession or control of such product except pursuant to a license or an exemption from licensing issued by the Commission.

ARTICLE IV

This Agreement shall not affect the authority of the Commission under subsection 161 b. or i. of the Act to issue rules, regulations, or orders to protect the common defense and security, to protect restricted data or to guard against the loss or diversion of special nuclear material.

ARTICLE V

The Commission will use its best efforts to cooperate with the State and other agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that State and Commission programs for protection against hazards of radiation will be coordinated and compatible. The State will use its best efforts to cooperate with the Commission and other agreement States in the formulation of standards and regulatory programs of the State and the Commission for protection against hazards of radiation and to assure that the State's program will continue to be compatible with the program of the Commission for the regulation of like materials. The State and the Commission will use their best efforts to keep each other informed of proposed changes in their respective rules and regulations and licensing, inspection and enforcement policies and criteria, and to obtain the comments and assistance of the other party thereon.

ARTICLE VI

The Commission and the State agree that it is desirable to provide for reciprocal recognition of licenses for the materials listed in Article I licensed by the other party or by any agreement state. Accordingly, the Commission and the State agree to use their best efforts to develop appropriate rules, regualtions, and procedures by which such reciprocity will be accorded.

ARTICLE VII

The Commission, upon its own initiative after reasonable notice and opportunity for hearing to the State, or upon request of the Governor of the State, may terminate or suspend all or part of this Agreement and reassert the licensing and regulatory authority vested in it under the

Act if the Commission finds that (1) such termination or suspension is required to protect the public health and safety, or (2) the State has not complied with one or more of the requirements of section 274 of the Act. The Commission shall periodically review this Agreement and actions taken by the State under this Agreement to ensure compliance with provisions of section 274 of the Act.

ARTICLE VIII

In the licensing and regulation of byproduct material as defined in section 11e.(2) of the Act, or of any activity which results in production of such material, the State shall comply with the provisions of section 274o. of the Act. If, in such licensing and regulation, the State requires financial surety arrangements for the reclamation or long term surveillance or maintenance of such material,

A. The total amount of funds the State collects for such purposes shall be transferred to the United States if custody of such material and its disposal site is transferred to the United States upon termination of the State license for such material or any activity which results in the production of such material. Such funds include, but are not limited to, sums collected for long term surveillance or maintenance. Such funds do not, however, include monies held as surety where no default has occurred and the reclamation or other bonded activity has been performed; and

B. Such State surety or other financial requirements must be sufficient to ensure compliance with those standards established by the Commission pertaining to bonds, sureties, and financial arrangements to ensure adequate reclamation and long term management of such byproduct material and its disposal site.

ARTICLE IX

This Agreement shall become effective on ____________ and shall remain in effect unless and until such time as it is terminated pursuant to Article VII.

Done at __________ State of __________ in triplicate, this __________ day of _______________.3/

FOR THE UNITED STATES ATOMIC
ENERGY COMMISSION

____

FOR THE STATE OF ____________

____

3/ The amendment to this Agreement pertaining to byproduct material as defined in section 11e.(2) of the Act became effective on ________. It was signed at ________________, State of ________________, in triplicate on ________________ by ____________ for the State of ____________, and signed at Washington, D.C., in triplicate, on ________________ by ________________ for the United States Nuclear Regulatory Commission.

ENCLOSURE 2

Statutes and Regulations

Enclosure II of the September 19, 1980 letter from Joseph O. Ward, Chief, Radiological Health Section to G. Wayne Kerr, Director, Office of State Programs, states that a supplemental response to our evaluation regarding Statutory Authority will be made under separate cover. As noted, we have not received this response. Secondly, the letter addresses draft regulations planned for December, 1980, which have not as yet been submitted to us.

At the present time, we are unaware of any uranium mill tailings regulations having ever been drafted by the State pursuant to Section 274.o of the Atomic Energy Act. We believe prompt action must be taken to develop these regulations. The statutes and regulations must be promulgated by November 8, 1981 in order for California to regulate uranium milling and mill tailings.

Further, the Uranium Mill Tailings Radiation Control Act (UMTRCA) requires that Agreement States have, as of November 8, 1981, regulations which are equivalent to the extent practicable, or more stringent than Commission regulations on uranium milling. The Commission considers that its regulations, which were recently promulgated, are practicable to implement in Agreement States as they are based upon the analysis in the final Generic Environmental Impact Statement On Uranium Milling, NUREG-0706, which addressed operations in both Agreement and non-Agreement States. Therefore, the Commission regulations constitute minimum national standards.

Existing California regulations do not cover any points in Appendix A to 10 CFR 40, or 10 CFR 150.31(b) of NRC's regulations (which constitute minimum national standards concerning technical, financial, and institutional control aspects of uranium mill tailings disposal under the Atomic Energy Act (AEA) Section 274.o(2), as amended).

We wish to emphasize that UMTRCA states that duplication of proceedings conducted by the Commisison is not necessary (last sentence of 274.o of AEA). Because the Commission developed the substantive regulations (45FR65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State could incorporate the record developed by the NRC and include it as a part of the rulemaking to help expedite any rulemaking that may be necessary under State law.

Preparation of Written Assessments

Title 10 CFR 150.31(b)(3)(iii) specifically states that "an Agreement State shall require for each licensing action which has a significant impact on the human environment a written analysis by the appropriate

State agency..." Article 9 of the California Administrative Code appears to contain adequate authority to require that an environmental assessment of a proposed action be prepared. However, the California Code does not contain language equivalent to the specifics of this requirement. A confirmation should be made that the State, through its Lead Agency, will prepare the written environmental assessment.

It is recommended that the State incorporate in its regulations the language of UMTRCA regarding the impacts to be considered in the environmental assessment. The regulations need to address radiological impacts not presently addressed. Nonradiological impacts which are addressed in Section 15143(a) of the California Code must include the specific considerations required by AEA Section 274.o(3)(c)(i) through 274.o(3)(c)(iv), as amended.

Written environmental assessments should be prepared for all licensing actions having significant impact on the human environment, i.e., new licensing actions, renewals, and major amendments. It appears that Section 15143.1 of the California Code might limit the scope of an assessment prepared in connection with some of the actions referred to above.

Pre-Licensing Construction

The California regulations do not appear to provide for any ban on pre-licensing construction as required by Section 274.o(3)(D) of the AEA and 10 CFR 150.31(b)(3)(iv).

NUCLEAR REGULATORY COMMISSION

Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Statement of Policy.

SUMMARY: The Nuclear Regulatory Commission has revised its statement of policy regarding criteria for guidance of States and NRC in discontinuance of NRC regulatory authority and assumption of regulatory authority by States through agreement. This action is necessary to make editorial changes to update the policy statement, to allow States to enter into agreements for low-level waste only, and to incorporate the provisions and requirements of the Uranium Mill Tailings Radiation Control Act of 1978. Adoption of this policy will allow interested States to enter into agreements with the NRC and regulate low-level waste sites only. Additionally, those States that meet the criteria for the regulation of uranium mills and tailings may exercise regulatory authority over these sources as provided by the Uranium Mill Tailings Radiation Control Act of 1978, as amended.

The revised statement of policy reflects the following principal changes:

1. Modification of Criterion 27 to allow a State to seek an agreement for the regulation of low-level waste as a separate category.

2. Inclusion of additional criteria for States wishing to continue regulating uranium and thorium processors and mill tailings after November 8, 1981.

3. Editorial and clarifying changes to make the statement current.

DATES: This policy statement is effective January 23, 1981.

FOR FURTHER INFORMATION CONTACT: John F. Kendig, Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone: 301-492-7767.

SUPPLEMENTARY INFORMATION:

1. These criteria were developed to implement a program, authorized by Pub. L. 86-373 which was enacted in the form of a new section to the Atomic Energy Act (Section 274) and approved by the President on September 23, 1959 and amended by Pub. L. 95-604 approved November 8, 1978. These criteria are intended to indicate factors which the Commission intends to consider in approving new or amended agreements. They are not intended to limit Commission discretion in viewing individual agreements or amendments. In accordance with these statutory provisions, when an agreement between a State and the NRC is effected, the Commission will discontinue its regulatory authority within that State over one or more of the following materials: byproduct material as defined in Section 11e(1) of the Act (radioisotopes), byproduct material as defined in Section 11e(2) of the Act (mill tailings or wastes), source material (uranium and thorium), special nuclear material (uranium 233, uranium 235 and plutonium) in quantities not sufficient to form a critical mass and permanent disposal of low-level waste containing one or more of the materials stated above but not including mill tailings.

2. An agreement may be effected between a State and NRC: (1) upon certification by the Governor that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement and the State desires to assume regulatory responsibility for such materials; and (2) after a finding by the Commission that the State program is in accordance with the requirements of subsection o of section 274 and in all other respects compatible with the Commission's program for the regulation of such materials, and is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement. It is also necessary that the State have enabling legislation authorizing its Governor to enter into such an agreement.

3. The original criteria were published on March 24, 1961 (26 FR 2537) after discussions with various State officials and other State representatives, to provide guidance and assistance to the States and the AEC (now NRC) in developing a regulatory program which would be compatible with that of the NRC. The criteria were circulated among States, Federal agencies, labor and industry, and other interested groups for comment.

4. The criteria require that the State authority consider the total accumulated occupational radiation exposure of individuals. To facilitate such an appoach, it is the view of the NRC that an overall radiation protection program is desirable. The maximum scope of

each State's radiation protection program is not, however, a necessary or appropriate subject for coverage in the criteria. Consequently, the criteria are silent on the question of whether a State should have a total regulatory program covering all sources of radiation, including those not subject to control by the NRC under the Atomic Energy Act, such as x-rays, radium, accelerators, etc.

5. These revised criteria provide for entering into an agreement for a separate category of materials, namely, low-level waste material in permanent disposal facilities. They also provide new criteria for States wishing to continue regulating uranium and thorium processing and the wastes resulting therefrom under the provisions of the Uranium Mill Tailings Radiation Control Act of 1978 (Pub. L. 95-604) after November 8, 1981. The revised criteria also contain a number of editorial changes such as changing AEC to NRC where appropriate to conform to present practice and law.

6. Inquiries about details of the criteria or other aspects of the NRC Federal-State Relations Program should be addressed to the Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Criteria [1]

Objectives

1. *Protection.* A State regulatory program shall be designed to protect the health and safety of the people against radiation hazards.

Radiation Protection Standards [2]

2. *Standards.* The State regulatory program shall adopt a set of standards for protection against radiation, which shall apply to byproduct, source and special nuclear materials in quantities not sufficient to form a critical mass.

3. *Uniformity in Radiation Standards.* It is important to strive for uniformity in technical definitions and terminology, particularly as related to such things as units of measurement and radiation dose. There shall be uniformity on maximum permissible doses and levels of radiation and concentrations of radioactivity, as fixed by Part 20 of the NRC regulations based on officially approved radiation protection guides.

4. *Total Occupational Radiation Exposure.* The regulatory authority shall consider the total occupational radiation exposure of individuals, including that from sources which are not regulated by it.

5. *Surveys, Monitoring.* Appropriate surveys and personnel monitoring under the close supervision of technically competent people are essential in achieving radiological protection and shall be made in determining compliance with safety regulations.

6. *Labels, Signs, Symbols.* It is desirable to achieve uniformity in labels, signs and symbols, and the posting thereof. However, it is essential that there be uniformity in labels, signs, and symbols affixed to radioactive products which are transferred from person to person.

7. *Instruction.* Persons working in or frequenting restricted areas [3] shall be instructed with respect to the health risks associated with exposure to radioactive materials and in precautions to minimize exposure. Workers shall have the right to request regulatory authority inspections as per 10 CFR 19, section 19.16 and to be represented during inspections as specified in section 19.14 of 10 CFR 19.

8. *Storage.* Licensed radioactive material in storage shall be secured against unauthorized removal.

9. *Waste Disposal.* The standards for the disposal of radioactive materials into the air, water, and sewers, and burial in the soil shall be in accordance with Part 20. Holders of radioactive material desiring to release or dispose of quantities in excess of the prescribed limits shall be required to obtain special permission from the appropriate regulatory authority.

10. *Regulations Governing Shipment of Radioactive Materials.* The State shall to the extent of its jurisdiction promulgate regulations applicable to the shipment of radioactive materials, such regulations to be compatible with those established by the U.S. Department of Transportation and other agencies of the United States whose jurisdiction over interstate shipment of such materials necessarily continues. State regulations regarding transportation of radioactive materials must be compatible with 10 CFR Part 71.

11. *Records and Reports.* The State regulatory program shall require that holders and users of radioactive materials (a) maintain records covering personnel radiation exposures, radiation surveys, and disposals of materials; (b) keep records of the receipt and transfer of the materials; (c) report significant incidents involving the materials, as prescribed by the regulatory authority; (d) make available upon request of a former employee a report of the employee's exposure to radiation; (e) at request of an employee advise the employee of his or her annual radiation exposure; and (f) inform each employee in writing when the employee has received radiation exposure in excess of the prescribed limits.

12. *Additional Requirements and Exemptions.* Consistent with the overall criteria here enumerated and to accommodate special cases or circumstances, the State regulatory authority shall be authorized in individual cases to impose additional requirements to protect health and safety, or to grant necessary exemptions which will not jeopardize health and safety.

Prior Evaluation of Uses of Radioactive Materials

13. *Prior Evaluation of Hazards and Uses, Exceptions.* In the present state of knowledge, it is necessary in regulating the possession and use of byproduct, source and special nuclear materials that the State regulatory authority require the submission of information on, and evaluation of, the potential hazards and the capability of the user or possessor prior to his receipt of the materials. This criterion is subject to certain exceptions and to continuing reappraisal as knowledge and experience in the atomic energy field increase. Frequently there are, and increasingly in the future there may be, categories of materials and uses as to which there is sufficient knowledge to permit possession and use without prior evaluation of the hazards and the capability of the possessor and user. These categories fall into two groups—those materials and uses which may be completely exempt from regulatory controls, and those materials and uses in which sanctions for misuse are maintained without pre-evaluation of the individual possession or use. In authorizing research and development or other activities involving multiple uses of radioactive materials, where an institution has people with extensive training and experience, the State regulatory authority may wish to provide a means for authorizing broad use of materials without evaluating each specific use.

14. *Evaluation Criteria.* In evaluating a proposal to use radioactive materials, the regulatory authority shall determine the adequacy of the applicant's facilities

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[1] The criteria were first adopted in February 1961 (26 FR 2537, March 24, 1961, and amended in November 1965 (30 FR 15044, December 4, 1965). Minor editorial changes were made in June 1968 to reflect the authority of the U.S. Department of Transportation and Organization change in NCRP.

[2] Suggested State regulations and State legislation will give content to all criteria enunciated.

[3] "Restricted area" means any area access to which is controlled by the licensee for the purpose of radiation protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include any area used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

and safety equipment, his training and experience in the use of the materials for the purpose requested, and his proposed administrative controls. States should develop guidance documents for use by license applicants. this guidance should be consistent with NRC licensing and regulatory guides for various categories of licensed activities.

15. *Human Use.* The use of radioactive materials and radiation on or in humans shall not be permitted except by properly qualified persons (normally licensed physicians) possessing prescribed minimum, experience in the use of radioisotopes or radiation.

Inspection

16. *Purpose, Frequency.* The possession and use of radioactive materials shall be subject to inspection by the regulatory authority and shall be subject to the performance of tests, as required by the regulatory authority. Inspection and testing is conducted to determine, and to assist in obtaining, compliance with regulatory requirements.

Frequency of inspection shall be related directly to the amount and kind of material and type of operation licensed, and it shall be adequate to insure compliance.

17. *Inspections Compulsory.* Licensees shall be under obligation by law to provide access to inspectors.

18. *Notification of Results of Inspection.* Licensees are entitled to be advised of the results of inspections and to notice as to whether or not they are in compliance.

Enforcement

19. *Enforcement.* Possession and use of radioactive materials should be amenable to enforcement through legal sanctions, and the regulatory authority shall be equipped or assisted by law with the necessary powers for prompt enforcement. This may include, as appropriate, administrative remedies looking toward issuance of orders requiring affirmative action or suspension or revocation of the right to possess and use materials, and the impounding of materials, the obtaining of injunctive relief, and the imposing of civil or criminal penalties.

Personnel

20. *Qualifications of Regulatory and Inspection Personnel.* The regulatory agency shall be staffed with sufficient trained personnel. Prior evaluation of applications for licenses or authorizations and inspection of licensees must be conducted by persons possessing the training and experience relevant to the type and level of radioactivity in the proposed use to be evaluated and inspected. This requires competency to evaluate various potential radiological hazards associated with the many uses of radioactive material and includes concentrations of radioactive materials in air and water, conditions of shielding, the making of radiation measurements, knowledge of radiation instruments—their selection, use and calibration—laboratory design, contamination control, other general principles and practices of radiation protection, and use of management controls in assuring adherence to safety procedures. In order to evaluate some complex cases, the State regulatory staff may need to be supplemented by consultants or other State agencies with expertise in geology, hydrology, water quality, radiobiology and engineering disciplines.

To perform the functions involved in evaluation and inspection, it is desirable that there be personnel educated and trained in the physical and/or life sciences, including biology, chemistry, physics and engineering, and that the personnel have had training and experience in radiation protection. For example, the person who will be responsible for the actual performance of evaluation and inspection of all of the various uses of byproduct, source and special nuclear material which might come to the regulatory body should have substantial training and extensive experience in the field of radiation protection. It is desirable that such a person have a bachelor's degree or equivalent in the physical or life sciences, and specific training-radiation protection.

It is recognized that there will also be persons in the program performing a more limited function in evaluation and inspection. These persons will perform the day-to-day work of the regulatory program and deal with both routine situations as well as some which will be out of the ordinary. These persons should have a bachelor's degree or equivalent in the physical or life sciences, training in health physics, and approximately two years of actual work experience in the field of radiation protection.

The foregoing are considered desirable qualifications for the staff who will be responsible for the actual performance of evaluation and inspection. In addition, there will probably be trainees associated with the regulatory program who will have an academic background in the physical or life sciences as well as varying amounts of specific training in radiation protection but little or no actual work experience in this field. The background and specific training of these persons will indicate to some extent their potential role in the regulatory program. These trainees, of course, could be used initially to evaluate and inspect those applications of radioactive materials which are considered routine or more standardized from the radiation safety standpoint, for example, inspection of industrial gauges, small research programs, and diagnostic medical programs. As they gain experience and competence in the field, trainees could be used progressively to deal with the more complex or difficult types of radioactive material applications. It is desirable that such trainees have a bachelor's degree or equivalent in the physical or life sciences and specific training in radiation protection. In determining the requirement for academic training of individuals in all of the foregoing categories proper consideration should be given to equivalent competency which has been gained by appropriate technical and radiation protection experience.

It is recognized that radioactive materials and their uses are so varied that the evaluation and inspection functions will require skills and experience in the different disciplines which will not always reside in one person. The regulatory authority should have the composite of such skills either in its employ or at its command, not only for routine functions, but also for emergency cases.

Special Nuclear Material, Source Material and Tritium

21. *Conditions Applicable to Special Nuclear Material, Source Material and Tritium.* Nothing in the State's regulatory program shall interfere with the duties imposed on the holder of the materials by the NRC, for example, the duty to report to the NRC, on NRC prescribed forms (1) transfers of special nuclear material, source material and tritium, and (2) periodic inventory data.

22. *Special Nuclear Material Defined.* Special nuclear material, in quantities not sufficient to form a critical mass, for present purposes means uranium enriched in the isotope U–235 in quantities not exceeding 350 grams of contained U–235; uranium 233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of

such ratios for all of the kinds of special nuclear material in combination should not exceed "1" (i.e., unity). For example, the following quantities in combination would not exceed the limitation and are within the formula, as follows:

$$\frac{175 \text{ (grams contained U-235)}}{350} + \frac{50 \text{ (grams U-233)}}{200} + \frac{50 \text{ (grams Pu)}}{200} = 1$$

* * *

(This definition is subject to change by future Commission rule or regulation.)

Administration

23. State practices for assuring the fair and impartial administration of regulatory law, including provision for public participation where appropriate, should be incorporated in procedures for:

a. Formulation of rules of general applicability;

b. Approving or denying applications for licenses or authorization to possess and use radioactive materials, and

c. Taking disciplinary actions against licensees.

Arrangements For Discontinuing NRC Jurisdiction

24. *State Agency Designation.* The State should indicate which agency or agencies will have authority for carrying on the program and should provide the NRC with a summary of that legal authority. There should be assurances against duplicate regulation and licensing by State and local authorities, and it may be desirable that there be a single or central regulatory authority.

25. *Existing NRC Licenses and Pending Applications.* In effecting the discontinuance of jurisdiction, appropriate arrangements will be made by NRC and the State to ensure that there will be no interference with or interruption of licensed activities or the processing of license applications, by reason of the transfer. For example, one approach might be that the State, in assuming jurisdiction, could recognize and continue in effect, for an appropriate period of time under State law, existing NRC licenses, including licenses for which timely applications for renewal have been filed, except where good cause warrants the earlier reexamination or termination of the license.

26. *Relations With Federal Government and Other States.* There should be an interchange of Federal and State information and assistance in connection with the issuance of regulations and licenses or authorizations, inspection of licensees, reporting of incidents and violations, and training and education problems.

27. *Coverage, Amendments, Reciprocity.* An agreement providing for discontinuance of NRC regulatory authority and the assumption of regulatory authority by the State may relate to any one or more of the following categories of materials within the State, as contemplated by Public Law 86–373 and Public Law 95–604:

a. Byproduct materials as defined in section 11e(1) of the Act,

b. Byproduct materials as defined in section 11e(2) of the Act,

c. Source materials,

d. Special nuclear materials in quantities not sufficient to form a critical mass,

e. Low-level wastes in permanent disposal facilities, as defined by statute or Commission rules or regulations containing one or more of the materials stated in a, c, and d above but not including byproduct material as defined in Section 11e(2) of the Act;

but must relate to the whole of such category or categories and not to a part of any category.[4] If less than the five categories are included in any discontinuance of jurisdiction, discontinuance of NRC regulatory authority and the assumption of regulatory authority by the State of the others may be accomplished subsequently by an amendment or by a later agreement.

The agreement may incorporate by reference provisions of other documents, including these criteria, and the agreement shall be deemed to incorporate without specific reference the provisions of Pub. L. 86–373 and Pub. L. 95–604 and the related provisions of the Atomic Energy Act.

Arrangements should be made for the reciprocal recognition of State licenses and Federal licenses in connection with out-of-the-jurisdiction operations by a State or Federal licensee.

28. *NRC and Department of Energy Contractors.* The State should provide exemptions for NRC and DOE contractors which are substantially equivalent to the following exemptions:

a. Prime contractors performing work for the DOE at U.S. Government-owned or controlled sites;

b. Prime contractors performing research in, or development, manufacture, storage, testing, or transportation of, atomic weapons or components thereof;

c. Prime contractors using or operating nuclear reactors or other nuclear devices in a U.S. Government-owned vehicle or vessel; and

d. Any other prime contractor or subcontractor of DOE or NRC when the State and the NRC jointly determine (i) that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety and (ii) that the exemption of such contractor or subcontractor is authorized by law.

Additional Criteria for States Regulating Uranium or Thorium Processors and Wastes Resulting Therefrom After November 8, 1981

Statutes

29. State statutes or duly promulgated regulations should be enacted, if not already in place, to make clear State authority to carry out the requirements or Public Law 95–604, Uranium Mill Tailings Radiation Control Act (UMTRCA) as follows:

a. Authority to regulate the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

b. That an adequate surety (under terms established by regulation) will be provided by the licensee to assure the completion of all requirements established by the (cite appropriate State agency) for the decontamination, decommissioning, and reclamation of sites, structures, and equipment used in conjunction with the generation or disposal of such byproduct material.

c. If in the States' licensing and regulation of byproduct material or of any activity which produces byproduct material, the State collects funds from the licensee or its surety for long-term surveillance and maintenance of such material, the total amount of the funds collected by the State shall be transferred to the U.S. if custody of the byproduct material and its disposal site is transferred to the Federal Government upon termination of the State license. (See 10 CFR 150.32.) If no default has occurred and the reclamation or other bonded activity has been performed, funds for the purpose

are not to be transferred to the Federal Government. The funds collected by the State shall be sufficient to ensure compliance with the regulations the Commission establishes pursuant to Section 161X of the Atomic Energy Act.

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[4] A State which does not wish to continue regulation of uranium and thorium processors and byproduct material, as defined in Section 11e.(2) of the Atomic Energy Act as amended, after November 8, 1981 pursuant to Pub. L. 95–604 may obtain authority over all source material licenses within the State except for uranium or thorium processors.

d. In the issuances of licenses, an opportunity for written comments, public hearing (with transcript) and cross examination is required.

e. In the issuances of licenses, a written determination of the action to be taken based upon evidence presented during the public comment period and which is subject to judicial review is required.

f. A ban on major construction prior to completion of the aforementioned stipulations.

g. An opportunity shall be provided for public participation through written comments, public hearings, and judicial review of rules.

30. In the enactment of any supporting legislation, the State should take into account the reservations of authority to the U.S. in UMTRCA as stated in 10 CFR 150.15a and summarized by the following:

a. The establishment of minimum standards governing reclamation, long-term surveillance or maintenance, and ownership of the byproduct material.

b. The determination that prior to the termination of a license, the licensee has complied with decontamination, decommissioning and reclamation standards, and ownership requirements for sites at which byproduct material is present.

c. The requirement that prior to termination of any license for byproduct material, as defined in Section 11e.(2), of the Atomic Energy Act or for any activity that results in the production of such material, title to such byproduct material and the disposal site be transferred to the Federal Government or State at the option of the State, provided such option is exercised prior to termination of the license.

d. The authority to require such monitoring, maintenance, and emergency measures after the license is terminated as necessary to protect the public health and safety for those materials and property for which the State has assumed custody pursuant to Pub. L. 95–604.

e. The authority to permit use of the surface or subsurface estate, or both of the land transferred to the United States or State pursuant under provision of the Uranium Mill Radiation Tailings Control Act.

f. The authority to exempt land ownership transfer requirements of Section 83(b)(1)(A).

31. It is preferable that State statutes contain the provisions of Section 6 of the Model Act. But the following may be accomplished by adoption of either procedures by regulation or technical criteria. In any case, authority for their implementation should be adequately supported by statute, regulation or case law as determined by the State Attorney General.

In the licensing and regulation of ores processed primarily for their source material content and for the disposal of byproduct material, procedures shall be established which provide a written analysis of the impact on the environment of the licensing activity. This analysis shall be available to the public before commencement of hearings and shall include:[6]

a. An assessment of the radiological and nonradiological public health impacts;

b. An assessment of any impact on any body of water or groundwater;

c. Consideration of alternatives to the licensed activities; and

d. Consideration of long-term impacts of licensed activities (see Item 36b.(1).

Regulations

32. State regulations should be reviewed for regulatory requirements, and where necessary incorporate regulatory language which is equivalent to the extent practicable or more stringent than regulations and standards adopted and enforced by the Commission, as required by Section 274o (see 10 CFR 40 and 10 CFR 150.31(b)).

Organizational Relationships Within the States

33. Organizational relationships should be established which will provide for an effective regulatory program for uranium mills and mill tailings.

a. Charts should be developed which show the management organization and lines of authority. This chart should define the specific lines of supervision from program management within the radiation control group and any other department within the State responsible for contributing to the regulation of uranium processing and disposal of tailings. When other State agencies or regional offices are utilized, the lines of communication and administrative control between the agencies and/or regions and the Program Director should be clearly drawn.

b. Those States that will utilize personnel from other State Departments or Federal agencies in preparing the environmental assessment should designate a lead agency for supervising and coordinating preparation of this environmental assessment. It is normally expected that the radiation control agency in Agreement States will be the lead agency. The basic premise is that the lead agency is required to prepare the environmental assessment. Utilization of an applicant's environmental report in lieu of a lead agency assessment of the proposed project is not adequate or appropriate. However, the lead agency may prepare an environmental assessment based upon an applicant's environmental report. Other credible information may be utilized by the State as long as such information is verified and documented by the State.

c. When a lead agency is designated, that agency should coordinate preparation of the statement. The other agencies involved should provide assistance with respect to their areas of jurisdiction and expertise. Factors relevant in obtaining assistance from other agencies include the applicable statutory authority, the time sequence in which the agencies become involved, the magnitude of their involvement, and relative expertise with respect to the project's environmental effects.

In order to bring an environmental assessment to a satisfactory conclusion, it is highly recommended that an initial scoping document be developed which clearly delineates the area and scope of work to be performed by each agency, within a given time constraint.

d. For those areas in the environmental assessment where the State cannot identify a State agency having sufficient expertise to adequately evaluate the proposal or prepare an assessment, the State should have provisions for obtaining outside consulting services. In those instances where non-governmenatal consultants are utilized, procedures should be established to avoid conflict of interest consistent with State law and administrative procedures.

Medical consultants recognized for their expertise in emergency medical matters, such as the Oak Ridge and Hanford National Laboratories, relating to the intake or uranium and its diagnosis thereof associated with uranium mining and milling should be identified and available to the State for advice and direct assistance.

During the budget preparation, the State should allow for funding costs incurred by the use of consultants. In addition, consultants should be available for any emergencies which

may occur and for which their expertise would be needed immediately.

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[6] It is strongly recommended that a 30-day period be provided for public review.

Personnel

34. Personnel needed in the processing of the license application can be identified or grouped according to the following skills: Technical: Administrative; and Support.

a. Administrative personnel are those persons who will provide internal guides, policy memoranda, reviews and managerial services necessary to assure completion of the licensing action. Support personnel are those persons who provide secretarial, clerical support, legal, and laboratory services. Technical personnel are those individuals who have the training and experience in radiation protection necessary to evaluate the enginering and radiological safety aspects of a uranium concentrator. Current indications are that 2 to 2.75 total professional person years' effort is needed to process a new conventional mill license, in situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years effort for support and legal services should be one secretary for approximately 2 conventional mills and ½ staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory support services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activitives of UMTRCA.

b. In evaluating license applications the State shall have access to necessary specialities, e.g., radiological safety, hydrology, geology and dam construction and operation.

In addition to the personnel qualifications listed in the "Guide for Evaluation of State Radiation Control Programs," Revision 3, February 1, 1980, the regulatory staff involved in the regulatory process (Radiation) should have additional training in Uranium Mill Health Physics and Environmental Assessments.

c. Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers.

Functions To Be Covered

35. The States should develop procedures for licensing, inspection, and preparation of environmental assessments.

a. *Licensing*

(1) Licensing evaluations or assessments should include in-plant radiological safety aspects in occupational or restricted areas and environmental impacts to populations in unrestricted areas from the plant.

(2) It is expected that the State will review, evaluate and provide documentation of these evaluations. Items which should be evaluated are:

(a) Proposed activities;

(b) Scope of proposed action;

(c) Specific activities to be conducted;

(d) Administrative procedures;

(e) Facility organization and radiological safety responsibilities, authorities, and personnel qualifications;

(f) Licensee audits and inspections;

(g) Radiation safety training programs for workers;

(h) Radiation safety program, control and monitoring;

(i) Restricted area markings and access control;

(j) At existing mills, review of monitoring data, exposure records, licensee audit and inspection records, and other records applicable to existing mills;

(k) Environmental monitoring;

(l) Emergency procedures, radiological;

(m) Product transportation; and

(n) Site and physical decommissioning procedures, other than tailings.

(o) Employee exposure data and bioassay programs.

b. *Environmental Assessment*

(1) The environmental evaluation should consist of a detailed and documented evaluation of the following items:

(a) Topography;

(b) Geology;

(c) Hydrology and water quality;

(d) Meteorology;

(e) Background radiation;

(f) Tailings retention system;

(g) Interim stabilization, reclamation, and Site Decommissioning Program;

(h) Radiological Dose Assessment;

(1) Source terms

(2) Exposure pathway

(3) Dose commitment to individuals

(4) Dose commitment to populations

(5) Evaluation of radiological impacts to the public to include a determination of compliance with State and Federal regulations and comparisons with background values

(6) Occupational dose

(7) Radiological impact to biota other than man

(8) Radiological monitoring programs, pre-occupational and operational

(i) Impacts to surface and groundwater, both quality and quantity;

(j) Environmental effects of accidents; and

(k) Evaluation of tailings management alternatives in terms of regulations.

(2) The States are encouraged to examine the need to expand the scope of the assessment into other areas such as:

(a) Ecology;

(b) Environmental effects of site preparation and facility construction on environment and biota;

(c) Environmental effects of use and discharge of chemicals and fuels; and

(d) Economic and social effects.

c. *Inspections*

(1) As a minimum, items which should be inspected or included during the inspection of a uranium mill should adhere to the items evaluated in the in-plant safety review. The principal items recommended for inspection are:

(a) Administration;

(b) Mill circuit, including any additions, deletions, or circuit changes;

(c) Accidents/Incidents;

(d) Part 19 or equivalent requirements of the State;

(e) Action taken on previous findings;

(f) A mill tour to determine compliance with regulations, and license conditions;

(g) Tailings waste management in accordance with regulations and license conditions (see NRC Reg. Guide 3.11.1);

(h) Records;

(i) Respiratory protection in accordance with license conditions or 10 CFR Part 20.

(j) Effluent and environmental monitoring;

(k) Training programs;

(l) Transportation and shipping;

(m) Internal review and audit by management;

(n) Exit interview; and

(o) Final written report documenting the results of the inspection and findings on each item.

(2) In addition, the inspector should perform the following:

(a) Independent surveys and sampling.

(3) Additional guidance is contained in appropriate NRC regulatory and inspection guides. A *complete* inspection should be performed at least once per year.

d. *Operational Data Review*

(1) In addition to the reporting requirements required by the regulations or license conditions, the licensee will submit in writing to the regulatory agency within 60 days after January 1 and July 1 of each year, reports specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous six months of operation. This data shall be reported in a manner that will permit the regulatory agency to confirm the potential annual radiation doses to the public.

(2) All data from the radiological and non-radiological environmental monitoring program will also be submitted for the same time periods and frequency. The data will be reported in a manner that will allow the regulatory agency to conform the dose to receptors.

Instrumentation

36. The State should have available both field and laboratory instrumentation sufficient to ensure the licensee's control of materials and to validate the licensee's measurements.

a. The State will submit its list of instrumentation to the NRC for review. Arrangements should be made for calibrating such equipment.

b. Laboratory-type instrumentation should be available in a State agency or through a commercial service which has the capability for quantitative and qualitative analysis of radionuclides associated with natural uranium and its decay chain, primarily: U-238, Ra-226, Th-320, Pb-210, and Rn-222, in a variety of sample media such as will be encountered from an environmental sampling program.

Analysis and data reduction from laboratory analytical facilities should be available to the licensing and inspection authorities in a timely manner. Normally, the data should be available within 30 days of submittal. State acceptability of quality assurance (QA) programs should also be established for the analytical laboratories.

c. Arrangements should also be completed so that a large number of samples in a variety of sample media resulting from a major accident can be analyzed in a time frame that will allow timely decisions to be made regarding public health and safety.

d. Arrangements should be made to participate in the Environmental Protection Agency quality assurance program for laboratory performance.

Dated at Washington, D.C. this 16th day of January, 1981.

For the Nuclear Regulatory Commission.

John C. Hoyle,

Assistant Secretary of the Commission.

[FR Doc. 81-2430 Filed 1-22-81; 8:45 am]

BILLING CODE 7590-01-M

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 1 2 1981

Mr. Charles H. Montange
Covington & Burling
888 Sixteenth Street, N.W.
Washington, D.C. 20006

Dear Mr. Montange:

This is to respond to your request of February 23, 1981 for copies of documents relating to any obligation of the Agreement States to adopt regulations concerning uranium mill tailings.

I am enclosing copies of letters sent in 1981 to Governors Lamm, Clements, King and Spellman from the Chairman on the readiness of their States to enter into amended agreements to permit their States to regulate uranium mills and tailings after November 8, 1981. These letters and their enclosures include discussions of the State's regulations for uranium mill tailings. We expect similar letters will soon be dispatched by the Chairman to Governors Atiyeh, Brown and List. I will furnish you copies of them when they are sent.

Following passage of the Uranium Mill Tailings Radiation Control Act of 1978, our office corresponded with the uranium mill States (as a group) on the requirements of the Act, including State regulations for uranium mills and tailings. Unfortunately, our office is relocating to another building and this portion of our files has been packed for the move. I will furnish you copies of these letters after our files are again available for searching.

Sincerely,

G. Wayne Kerr

G. Wayne Kerr, Director
Office of State Programs

Enclosures:
As stated

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

January 29, 1981

The Honorable Bruce King
Governor of New Mexico
Santa Fe, New Mexico 87503

Dear Governor King:

On May 1, 1974, New Mexico became an Agreement State under Section 274 of the Atomic Energy Act of 1954. Under the provisions of this Act, New Mexico assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor-produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. New Mexico applied for and received a grant of $133,900 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Mr. Thomas E. Baca, Director, Environmental Improvement Division of the Department of Health & Environment, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Mr. Baca and his staff and to identify remaining actions which New Mexico must accomplish for a timely amended agreement.

As a result of information exchanged between the NRC and New Mexico, in July, 1980, we provided Mr. Baca with our initial assessment of the readiness of New Mexico for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). Additional information was provided by Mr. Baca which we have evaluated. The results of this evaluation are discussed in Enclosure 2 to this letter. I would like to highlight two of the actions still needed:

1. New Mexico has not yet promulgated complete regulations to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. Prompt action in advance of the amended agreement, as required by the UMTRCA and noted in previous NRC correspondence with the State, should be taken by New Mexico to develop upgraded tailings management programs that meet UMTRCA requirements at existing mill sites.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining New Mexico's actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by New Mexico of the application for amendment.

While, in our opinion, New Mexico has taken steps toward compliance with UMTRCA, more needs to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. W. Kerr, Director of NRC's Office of State Programs.

Sincerely,

J F Ahearne
John F. Ahearne
Chairman

Enclosures:
As stated

cc: T. Baca, New Mexico w/encls.
T. Wolff, New Mexico w/encls.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

FEB 20 1981

The Honorable Richard D. Lamm
Governor of Colorado
Denver, Colorado 80203

Dear Governor Lamm:

On February 1, 1968, Colorado became an Agreement State under Section 274 of the Atomic Energy Act of 1954. Under the provisions of this Act, Colorado assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Colorado applied for and received a grant of $95,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Dr. Frank Traylor, Executive Director, Colorado Department of Health, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Dr. Traylor and his staff and to identify remaining actions which Colorado must accomplish for a timely amended agreement.

In the summer of 1980, we began an early review of current and potential uranium mill Agreement State programs to provide an early indication of where each State stands in preparing to enter into amended agreements. On July 25, 1980, we wrote to Dr. Traylor and reported our initial assessment of the Colorado program for regulating uranium mills and tailings with respect to the criteria. We have received letters from Mr. Albert J. Hazle, Director, Radiation and Hazardous Wastes Control Division, Department of Health, commenting on the NRC's criteria, but we have received no specific response to our July 25, 1980 letter. With these letters and with information obtained during our regular review of the Colorado radiation control program, we have reassessed the readiness of Colorado for an amended agreement to regulate uranium mills. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). The results of our evaluation are discussed in Enclosure 2 to this letter. I would like to highlight two of the actions still needed:

1. Revisions to Colorado's regulations will be needed to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. In our evaluation of the readiness of Colorado, additional staffing will be needed by Colorado to meet upgraded requirements of UMTRCA. We will give the same weight to resource commitments as is given to statutory and regulatory enactments.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining Colorado's actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by Colorado of the application for amendment.

While, in our opinion, Colorado has taken some initial steps toward compliance with UMTRCA, there is much to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. Wayne Kerr, Director of NRC's Office of State Programs.

Sincerely,

/s/
John F. Ahearne
Chairman

Enclosures:
As Stated

cc: Dr. Traylor, Colorado w/encl.
A. Hazle, Colorado w/encl.

ENCLOSURE 2

COLORADO

Regulations - General Comments

The Colorado regulations do not cover all of the points in Appendix A, to 10 CFR 40 and 150.31(b) (which constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal under Atomic Energy Act (AEA) Section 274.o(2), as amended). While there are some limited technical requirements in the State regulations, (for example, §§ R.H. 3.8 and R.H. 3.9), 10 CFR 40 Appendix A, Introduction, and Criteria 1-8 and 11 and 12 are not covered. Financial surety arrangements (Criterion 9) and long-term funding requirements (Criterion 10) are addressed in the State's regulations; comments on these sections of the Colorado regulations are provided in later parts of this enclosure.

Also, with regard to regulation development, the State must develop a program for implementation of U.S. EPA fuel cycle radiation protection standards (40 CFR 190) at mills in addition to regulations to be developed under Section 274.o(2).

In connection with developing regulations, the State should recognize that the Uranium Mill Tailings Radiation Control Act of 1978, as amended, (UMTRCA) states that duplication of proceedings conducted by the Commission is not necessary (last sentence of 274.o of AEA). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law.

It is also noted that UMTRCA requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable or more stringent than Commission regulations on uranium milling (10 CFR 150.31(b)(2)). The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS* which addressed operations in both Agreement and Non-Agreement States. The Commission regulations constitute minimum national standards.

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*GEIS - Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706).

Financial Surety

Section R.H. 3.9.4 of the Colorado regulations appears to contain adequate authority to require mill operators to furnish financial surety arrangements; however, the provisions for exemptions to this requirement (specifically, Section R.H. 3.9.4.1.2.5) are not appropriate. Any uranium recovery operation will require some facility and site cleanup prior to termination of the license. Therefore, as indicated in 10 CFR 40 Appendix A, Criterion 9, each uranium recovery licensee must provide assurances that he will perform such activities. In addition, R.H. 3.9.4.2.2 permits as adequate financial surety a personal bond backed by collateral. This does not appear to provide adequate protection consistent with 10 CFR 40, Appendix A, Criterion 9 (as discussed more fully in NUREG-0706, Final Generic Environmental Impact Statement on Uranium Milling). R.H. 3.9.4.2.5 permits other unidentified means of financial surety. The regulations should clearly indicate that no financial arrangement which constitutes or provides no greater assurance than self-insurance will be acceptable.

Regarding specific arrangements and terms of surety mechanisms, the regulations do not clearly indicate that the State intends to follow the standards established by the Commission as required.

R.H. 3.3.9.4.2 requires that financial surety be provided prior to the issuance of new licenses and prior to amendment or renewal of existing licenses. Under this section it is possible for currently licensed mills to continue in operation for some time (until license renewal or amendment) without financial surety. This is contrary to 10 CFR 40 Appendix A, Criterion 9 which requires financial surety prior to commencement of operations. Operation after November 8, 1981 without financial surety arrangements should not be permitted. Prior to that date the State should require financial surety arrangements to the maximum extent practicable.

Long-Term Surveillance and Monitoring

R.H. 3.9.5 provides that a long-term monitoring and maintenance fund may be required. This is in contrast to 10 CFR 40, Appendix A, Criterion 10 which provides that a minimum charge shall be paid by each mill operator to cover the cost of long-term surveillance prior to the termination of a mill license. No provision corresponding to 10 CFR § 150.32 regarding transfer of long-term monitoring funds to the state or U.S. is found in either the State statutes or regulations. Nor are provisions relating to transfer of tailings disposal land to the State or U.S. as required by 10 CFR 40, Appendix A, Criterion 11, to be found in the State statutes.

It appears that the existing Colorado legislation or regulations nowhere require efforts to eliminate the need for active, ongoing maintenance of sites over the long term. This is a fundamental requirement of 10 CFR 40, Appendix A, Criteria 1 and 12 and is consistent with Section 161.x.(2)(A) of AEC, as amended. While there may be some uncertainty over the degree of ongoing surveillance that will be needed over the long term, the clear thrust of legislation and regulations must be to require elimination of active maintenance (see also 12.3.11 and 14.3 of NUREG-0706). This concept should be stated explicitly in State regulations so that the existence of a "Long-Term Care" fund does not encourage programs which need ongoing active maintenance. (For example, this would include amending R.H. 3.9.5, which provides for the collection of monies to cover long-term maintenance, to make it clear that no active maintenance can be necessary over the long term to preserve isolation.)

Section R.H. 3.9.5.3 of Colorado's regulations conflict with Section 83(b)(2) of the Atomic Energy Act, as amended, and 10 CFR 150.15a(b)(5) which reserve to the Commission authority to make determinations concerning the necessary level of long-term monitoring and surveillance.

Written Environmental Assessments

Colorado regulations contain no requirement for a written environmental analysis to be prepared by the State, as required by Section 274o(3)(C) of the Atomic Energy Act, as amended. We recognize, through our involvement in providing technical assistance to the State, that Colorado has prepared such assessments in connection with several recent licensing cases; however, the requirements must be an explicity programmatic requirement. Such assessments should be prepared for all licensing actions having significant impact on the human environment, i.e., new licensing actions, renewals, and major amendments. All aspects of the assessment, required by AEA 274.o(3)(c) (including those conducted by other State agencies), must be included in the documented analysis.

Further, procedures should be provided which assure that this documented assessment will be made available for public review and comment for some reasonable amount of time before proceedings (including hearings) on issuance of the license begin, 10 CFR 150.31(b)(3)(i)(A)).

NOTE: In Section R.H. 3.9.4.1.2.5, specific emphasis appears to be placed on radiological impacts. In order to comply with Section 274o(3)(C)(i) of the AEA, as amended, equal emphasis, throughout the mill program, should be placed on non-radiological impacts.

Pre-Licensing Construction

Colorado regulations, Section RH 3.8.7, provides for a ban on prelicensing construction, unless an exemption is granted by the Department. The factors to be considered in granting exemptions from the construction ban appear to be subject to extremely liberal interpretation. It should be noted that 10 CFR § 150.31(b)(3)(iv) provides for no such exemptions.

Staff Resources and Organizational Relationships

Although the lines of communication and administrative control between organizations within the Department of Health appear to be clearly drawn, the relationship between other State organizations which review environmental reports for uranium mills including: the Department of Natural Resources; the Department of Highways; the Department of Local Affairs; the Colorado Land Use Commission; the Office of the Governor; the Socio-Economic Impact Coordinator's Office; the Office of the State Archeologist; and the State Historical Society, does not appear to be clear. With regard to these other State agencies, documentation should be provided which indicates the specific areas of jurisdiction and expertise related to uranium milling activities. In addition, the time sequence in which other organizations or individuals become involved and the magnitude of their involvement should be provided. More specifically, the arrangements for making such resources available on a routine and continuing basis should be documented and confirmed by budgetary cost centers to ensure that the required independent environmental appraisal will be completed.

Colorado personnel resources need to be significantly upgraded if these resources are to be adequate for processing license applications and carrying out other regulatory responsibilities.

Current indications are that 2 to 2.7 total professional person years' effort is needed to process a new conventional mill license, in-situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years' effort for support and legal services should be one secretary for approximately 2 conventional mills and 1/2 staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activities of UMTRCA.

Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers, then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers. (Criterion 34).

In order to evaluate the State's compliance with Criteria 34a and b, the level of staff effort devoted to uranium mill regulatory activities and the specialties of the individuals involved should be provided.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

January 29, 1981

The Honorable William P. Clements
Governor of Texas
Austin, Texas 78711

Dear Governor Clements:

On March 1, 1963, Texas became an Agreement State under Section 274 of the Atomic Energy Act of 1954. Under the provisions of this Act, Texas assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Texas applied for and received a grant of $80,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Dr. Robert Bernstein, Commissioner, Texas Department of Health, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Dr. Bernstein and his staff and to identify remaining actions which Texas must accomplish for a timely amended agreement.

As a result of information exchanged between the NRC and Texas, in July, 1980, we provided Dr. Bernstein with our initial assessment of the readiness of Texas for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). Additional information was provided by Dr. Bernstein which we have evaluated. The results of this evaluation are discussed in Enclosure 2 to this letter. I would like to highlight several of the actions still needed:

1. Texas has not yet promulgated enabling legislation and implementing regulations to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. Prompt action in advance of the amended agreement as required by the UMTRCA should be taken by Texas to develop upgraded tailings management programs that meet UMTRCA requirements at existing mill sites.

3. In our evaluation of the readiness of Texas, additional staffing will be needed by Texas to meet upgraded requirements of UMTRCA. We will give the same weight to resource commitments as is given to statutory and regulatory enactments.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining Texas' actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by Texas of the application for amendment.

While, in our opinion, Texas has taken some initial steps toward compliance with UMTRCA, there is much to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. W. Kerr, Director of NRC's Office of State Programs.

Sincerely,

John F. Ahearne
Chairman

Enclosures: As Stated

cc: Dr. Bernstein, Texas w/encl.
D. Lacker, Texas w/encl.

Enclosure 2

TEXAS

Progress of Legislation Development

The State does not have legislation in place. There is very little time remaining before it must be in place and the Texas legislative agenda is also limited. Prompt action must be taken. (Criterion 29)*

Long Term Surveillance and Monitoring**

The draft law provides for the establishment of a "Radiation and Perpetual Care Fund" (new section 17 of Texas Act) to cover costs of "maintenance, surveillance or other care on a continuing or perpetual basis after termination of the licensed facility."

1. The draft law nowhere requires the minimization or elimination of the need for active ongoing maintenance of sites over the long term. This is a fundamental requirement of 10 CFR 40, App. A, Criteria 1 and 12 and consistent with Sec. 161.x(2)(A) of the Atomic Energy Act (AEA), as amended, which requires eliminating long term maintenance and monitoring to the extent practicable. While there may be some uncertainty over the degree of ongoing surveillance that will be needed over the long term, the clear thrust of legislation and regulations must be to require the minimization or elimination of active maintenance (See also 12.3.11 and 14.3 of NUREG-0706.) This concept should be stated explicitly in the legislation and implementing regulations. It is suggested the term "Perpetual Care" be dropped from the title of this fund. Experience in other states has indicated that presence of such phraseology has been used by potential mill operators as reasons for not developing programs which eliminate need for ongoing, active care. (Sec. 161.x(2)(A) of AEA).

2. The relationship between financial surety and long-term funding concepts should be clearly established in the statutes or in the regulations. Proposed revisions to the Texas Act (Sections 3(m) 6 (f), 16 (a)(4) and 17)) are not entirely clear on this matter.

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* Where a reference is made to the Criteria, unless otherwise specified, this refers to the criteria contained in "SECY 80-472," (Enclosure 1).

** Comments on legislation are based on review of draft legislation (marked 2nd draft) of November 18, 1980. Wherever used, "Texas Act" refers to the existing legislation being amended (Chapter 72, Acts of the 57th Legislature, as amended).

The regulations and legislation must assure that adequate financial arrangements are available at all times during mill operation and thereafter to protect the public health and safety. (Criteria 29(b) and 30(a)).

3. Section 17(g) of the proposed legislation should be revised to authorize the agency to transfer funds to the United States for long-term surveillance and control in the event the State chooses not to become owner of a tailings disposal site. The amount of such transfer should be determined at the time of transfer by mutual agreement of the State.

Financial Surety Mechanisms

The legislation as drafted provides adequate authorities for requiring financial sureties. However, it is not clear from the legislation that the State will follow those sections of regulations of the Commission prescribing the acceptability of financial surety mechanisms. (See new Sec. 6(g) of Texas Act.) Texas apparently intends to permit self-insurance which would not meet NRC regulations based on conversations with Texas Department of Health staff. (Criterion 9 in Appendix A to 10 CFR 40).

Immediate Action at Existing Sites

During the interim period (before November 1981) Section 204 (h)(1) of the Uranium Mill Tailings Radiation Control Act of 1978, as amended, (UMTRCA) requires for Agreement States to implement NRC regulations to the maximum [illegible]able as stated in the FR Notice issuing the regulations [illegible] 30). The Commission considers it practicable and necessary for Agreement States' mill operators:

(a) to begin now (as opposed to after November 1981) to develop programs meeting the regulations;

(b) to submit such programs to the Agreement States on the same schedule as non-Agreement State operations;

(c) and to immediately implement steps to deal with presently occurring impacts such as blowing of tailings and uncontrolled seepage.

Regarding this matter, the Texas Department of Health (TDH) was notified in letters from G. W. Kerr dated March 25, 1980, and May 9, 1980, that UMTRCA required that agreement states take immediate steps to acquire a commitment by existing uranium mill operators to specific tailings reclamation programs. Based on our recent review of the Texas radiation control program, we note that we found no documentation that any steps have yet been taken in this matter. (10 CFR 150.31(a)).

Regulations Development

No regulations have been issued (nor even drafted) by the State as required by Section 274.o, Atomic Energy Act (AEA). Prompt action must be taken to develop these regulations. Under any circumstance, the regulations must be in place by November 1981. In connection with regulations development, it is noted that UMTRCA requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable, or more stringent than Commission regulations on uranium milling. The Commission considers that such regulations recently promulgated are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS* which addressed operations in both Agreement and Non-Agreement States. Therefore, the Commission regulations constitute minimum national standards. This appears to be recognized in proposed new Sec. 6A(a)(1) of Texas Act; the regulations developed should likewise reflect this. (Criterion 32 and 10 CFR 150.31).

Also, in connection with developing regulations, the State should also recognize the UMTRCA states that duplication of proceedings conducted by the Commission is not necessary (last sentence of 274.o of AEA). Therefore, because the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), no substantive proceedings need be conducted by the State in developing its regulations. These NRC regulations include the minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal. The State could incorporate the record developed by the NRC and include it as a part of the rulemaking to help expedite any rulemaking that may be necessary under State law. (Criterion 32).

Also, with regard to regulation development, the State must develop a program for implementation of U. S. EPA fuel cycle radiation protection standards (40 CFR 190) at mills in addition to regulations to be developed under Section 274.o(2).

Related to item 35(a) of the NRC evaluation criteria, the Texas reply of September 29, 1980, to the initial NRC status report lists applicable regulatory guides, standards and other sources that are used in the Texas program. The list seems to be adequate except that the guide, "Information Required and Criteria Used to Evaluate Embankment Retention Systems," (undated) should be deleted because it has been superseded by Regulatory Guide 3.11, which is included in the list. (Criterion 35(a)).

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*GEIS - Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706).

Staff Resources

Texas personnel resources need to be significantly upgraded if these resources are to be adequate for processing license applications and carrying out other regulatory responsibilities.

Current indications are that 2 to 2.7 total professional person years' effort is needed to process a new conventional mill license, in-situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years effort for support and legal services should be one secretary for approximately 2 conventional mills and ½ staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activities of UMTRCA.

Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers, then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers. (Criterion 34).

Preparation of Written Assessments

Several recent assessments performed by the State of Texas (Caithness and Trevino projects) in connection with the licensing of new in-situ uranium extraction projects do not meet the requirements of UMTRCA. (Sec. 274.o(3)(C) of AEA). The assessments did not document detailed evaluation of the most significant environmental impacts that will occur with, and associated controls which will be provided for, the project--those related to groundwater. For example, the following should also be included:

(a) determination of adequate geologic confinement of the ore zone and associated leach field,
(b) monitoring requirements,

(c) groundwater restoration criteria,
(d) operating limits (including specifications of upper control limits),
(e) plugging of exploration wells and well abandonment procedures, and
(f) well construction and testing. (Criterion 35(b)).

It appears that the Texas Department of Health is relying upon the Department of Water Resources to handle these aspects of project review and permitting. This appears to be acceptable, but the written assessment must document the evaluation that Water Resources performs. /_See Sec. 274.o(3)(C) which requires that the environmental impacts of "any activities conducted pursuant" to the license being granted be included in the assessment._/ Other comments on these assessments are:

o Most technical aspects of license applications did not appear to receive a rigorous independent review. The State often accepted the data and information submitted by the licensee and did not attempt a separate confirmatory analysis.

o In our recent review of the Texas mill licensing program, it appears that the Radiation Control Branch (RCB) only considers radiological aspects of mill tailings. This is not consistent with UMTRCA. The State should assure that both radiological and non-radiological aspects of environmental impacts are independently assessed and incorporated into licensing actions and enforced.

The above highlights the need for clarification of organizational relationships between various state agencies involved in the regulatory program for uranium mills and tailings. (Criteria 33(b)).

While the draft of proposed legislation specifically requires a written environmental analysis, it varies from NRC suggested State legislation in not having a separately stated requirement for including long-term impacts, including decommissioning, etc., but rather appears to attempt to subsume long-term impacts under other requirements. The Texas approach (Section 12A(a) is not as clear cut as the suggested approach and should be revised. (Criterion 35(b); Section 274.o(3)(C) of the AEA, as amended.)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

February 10, 1981

The Honorable John Spellman
Governor of Washington
Olympia, Washington 98504

Dear Governor Spellman:

On December 31, 1966, Washington became an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended. Under the provisions of this Act, Washington assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Washington applied for and received a grant of $80,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Mr. Gerald E. Thomas, Acting Secretary, Department of Social and Health Services, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Mr. Thomas and his staff and to identify remaining actions which Washington must accomplish for a timely amended agreement.

As a result of information exchanged between the NRC and Washington, in July, 1980, we provided the Department with our initial assessment of the readiness of Washington for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). Additional information was provided by the Department which we have evaluated. The results of this evaluation are discussed in Enclosure 2 to this letter and I would like to highlight specific actions still needed:

1. Revisions to Washington's regulations will be needed to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. Prompt action in advance of the amended agreement as required by the UMTRCA should be taken by Washington to develop upgraded tailings management programs that meet UMTRCA requirements at existing mill sites.

3. In our evaluation of the readiness of Washington, additional staffing will be needed by Washington to meet upgraded requirements of UMTRCA. We will give the same weight to resource commitments as is given to statutory and regulatory enactments.

I wish to acknowledge and commend the State's efforts to expeditiously revise and conform its regulations to meet the requirements of UMTRCA. These past revisions were made based upon earlier draft NRC regulations. Final regulations for uranium mills were issued by NRC on October 3, 1980, the reporting requirements of which became effective January 5, 1981. Many, although not all, of our comments on the Washington regulations reflect differences between the draft and final NRC regulations. We will be pleased to meet with your staff to discuss these differences and to explain our other comments.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining Washington's actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by Washington of the application for amendment.

While, in our opinion, Washington has taken many steps toward compliance with UMTRCA, more needs to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. W. Kerr, Director of NRC's Office of State Programs, 301/492-8170.

Sincerely,

Original Signed By
John F. Ahearne
John F. Ahearne
Chairman

Enclosures:
As Stated

cc: G. Thomas, Washington w/encls.
J. Beare, Washington w/encls.

ENCLOSURE 2

WASHINGTON

Written Assessments

The State Environmental Policy Act and implementing guidelines appear to contain adequate authority and requirements for a written analysis of the impact of a proposed activity which would satisfy the requirements of §274o(3)(C) of the Atomic Energy Act (AEA), as amended (WAC 197-10-100, 405, 420, 425). It is understood that the State guidelines permit preparation of the EIS by persons outside the lead agency under the direction of a responsible official within the lead agency. In fact, it is noted that the applicant was listed as a contributor to the recent draft statement prepared on the Dawn project. This has the appearances of conflict of interest. The State must do an *independent* assessment of each of the environmental impact areas delineated in §274o(3)(C) of the AEA; assessments by applicants or operators cannot be accepted without independent review by the State. It should be demonstrated how independence in the State asesssment is assured. (10 CFR §150.31(b)(3)(iii)). The written assessments required by State regulations appear to satisfy the requirement of Section 274o(3)(C)(iv) with the exception that there is no provision for addressing decontamination.

Regulations

It is noted that the Uranium Mill Tailings Radiation Control Act (UMTRCA) requires that Agreement States have, as of November 1981, regulations which are equivalent *to the extent practicable*, or more stringent than Commission regulations on uranium milling. The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS which addressed operations in both Agreement and non-Agreement States. The Commission regulations constitute *minimum* national standards (10 CFR §150.31).

In connection with this, the staff has reviewed Washington's regulations, including those which were scheduled for adoption on November 24, 1980. Although the State's regulations address many of the significant issues, they do not adequately cover all of the points in Appendix A to 10 CFR 40 and 10 CFR §150.31(b) (which, as indicated above, constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal). Comments on the specific provisions of the State's regulations in terms of their equivalency to minimum national standards are contained in later sections of this enclosure.

In connection with developing these regulations, the State should recognize that the UMTRCA states that duplication of proceedings conducted by the Commission is not necessary (last sentence of Section 274o of the AEA, as amended). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law. In fact, the simplest approach might be for the State to adopt language identical to that contained in the NRC regulations.

A detailed review of the Washington regulations is attached.

Immediate Action at Existing Mills

During the interim period (before November 1981) §204(h)(1) of UMTRCA, as amended requires Agreement States to implement NRC regulations to the maximum extent practicable, as stated in the FR Notice issuing the regulations (see 45 FR 65530). The Commission considers it practicable and necessary for Agreement States' mill operators:

(a) to begin now (as opposed to after November 1981) to develop programs meeting the regulations;

(b) to submit such programs to the Agreement States on the same schedule as non-Agreement State operations;

(c) and to immediately implement steps to deal with presently occurring impacts such as blowing of tailings and uncontrolled seepage.

By nature of its participation in the environmental assessment conducted in connection with the Dawn Mining Company license renewal, the NRC staff is aware that some steps are being taken to upgrade operations at this facility. However, at the present time, we are unaware of any steps which Washington has taken in this matter pertaining to the Western Nuclear, Sherwood facility.

Staff Resources and Organizational Relationships

The Washington response indicates that 2.55 staff years' effort is currently dedicated to uranium mill licensing activity. As indicated, this is appropriate for handling a major license renewal; however, it does not take into account the other miscellaneous licensing activities referred to in Criterion 34(a) (SECY-80-472). The specific agreements which document that such services are, in fact, available should be provided. The experience of the individuals who contribute to the 2.55 staff years of effort should also be provided in order for NRC to determine whether these, supplemented by the consultants and other contributing agency personnel referred to, constitute an adequately qualified staff.

The Washington response further indicates that the State understands and acknowledges the requirements of Criterion 33 (a-c). The response states that Department of Social and Health Services (DSHS) staff have begun developing interagency agreements with other State organizations. Charts indicating which other State organizations will contribute to an environmental assessment (presumably those offices with which DSHS is developing agreements) should be provided. A discussion of the area and level of each group's involvement in a review and their corresponding contribution to an assessment would be helpful in understanding State compliance with Criterion 33a. The State response should also include a discussion of contributions from groups within the DSHS other than the Radiation Control Section. The arrangements for making such resources available should be documented, confirmed by budgetary cost centers, and should clearly indicate the lines of communication and administrative control exercised by the lead agency in order to ensure that the required independent environmental appraisal will be completed.

With respect to consultants, we need to know the degree to which the State will rely on consultants, identification of those substantive areas for which consultants will be contracted, an indication of the qualification requirements for such consultants, and the budget planning that will be provided to assure these consultative services will be available on a routine and continuing basis.

Inspections

In Mr. Strong's September 24, 1980 letter to Mr. Kerr, it was stated that inspections of uranium mills will be performed by doing one quarter of a complete inspection four times a year (p.3, Item VI.C.1). We see no problem with this inspection plan provided it is clear that at the end of a year a complete inspection has been performed.

Public Hearings

Opportunity for public hearing must be provided regardless of environmental significance. In addition, the scope of the hearing must extend to the question of license issuance, not merely to the adequacy of the reclamation, disposal, decommissioning and decontamination plan (Section 274o.(3)(A)(i), AEA).

ATTACHMENT

DETAILED REVIEW OF WASHINGTON REGULATIONS IN TERMS OF APPENDIX A, 10 CFR 40

Our review was conducted by comparing the Washington regulations with Appendix A, 10 CFR 40. A mark-up of Appendix A is included and each point which the State regulations must cover in an equivalent manner has been annotated ("A", "A-1", "B-1", etc.). The results of our review are summarized in the following table where we indicate those points that were adequately covered or not covered in the present Washington regulations. Following the table, we have provided clarifying comments.

ANNOTATED POINTS OF APPENDIX A

Section	Not Covered Adequately	Covered	
Introduction	B, C, D	A	402-52-005[+] -010(5)
Criterion 1	B, C, A-2, A-3	A-1	-015(1)
		D	-020
Criterion 2	A*		
Criterion 3	B, C	A,* D	-015(3)
Criterion 4	C-1,* C-2, C-3, E, F, G-1, G-2, G-3, G-4, G-5, (G*), H,* I,* J	A B D K* L*	-015(2)(a) -015(2)(a) -020(2) -015(3) -015(5)
Criterion 5	A,* B, C-2, C-3, E-2, E-3, E-4, G, H, I, J, K-1, K-2, K-3, K-4, K-5, K-6	C-1 D* E-1 F L	-015(6)(a) -015(6)(b) -015(6)([illegible]) -015(6)(c) -015(6)(d)
Criterion 6	B, E-1, E-2, F*	A, C, D	-020(2)

[+] Section of the Washington regulations where the identified item from NRC regulations is covered. Unless otherwise stated, the citation of Washington regulations is in abbreviated form and applies to Section WAC 402-52 (for example, Section WAC 402-52-010(1) is cited as -010(1).)

* Clarifying comments are made on this item following the table.

Section	Not Covered Adequately	Covered
Criterion 7		A -015(7) B -010(6)
Criterion 8	B, C-1, C-2, C-3, C-4, C-5, C-6, (C*), E	A -025(1), -010(-010(4) D -010(7) F -025(3)
Criterion 8a	A*, B	
Criterion 9	B-2, B-3, C,* D, E, F,* G,* H, I, K	A-1 402-22-070(6)(b) A-2 402-22-070(6)(b) B-1 402-22-070(6)(b) J* 402-22-070(6)(b)
Criterion 10*	A, B, C	
Criterion 11*	A,* D, E	B 402-22-070(6)(c) C 402-22-070(6)(c)
Criterion 12	B, C	A 402-52-020

CLARIFYING COMMENTS

Introduction:

None

Criterion 1:

None

Criterion 2:

1. WAC-402-52-015 needs to make a stronger statement regarding the non-proliferation of small waste disposal sites. The present state requirement is only that consideration be given to the utilization of existing sites. The requirement should indicate that wastes from small operations shall be disposed of at existing sites unless the impacts of such offsite disposal clearly outweigh the benefits or demonstrate it to be impracticable.

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* Clarifying comments are made on this item following the table.

Criterion 3:

1. Item** A - See Comment No. 4, under "Other Comments," below.

Criterion 4:

1. Items C-1 and H -- WAC 402-52-020(2) (first part) addresses this generally but does not clearly indicate gradual slopes and contouring are necessary primarily for erosion control.

2. WAC 402-51-010(6), -015(d), -020(4) refer to use of drainage or diversion ditches near impoundments; it must be explicitly stated that such structures are not acceptable for long-term diversion of waters unless small upstream drainages are involved and it can be clearly shown that they will not require active maintenance.

3. WAC 402-52-015(d) calls for upstream catchments to be provided. This conflicts with item A and should be deleted.

4. Item G -- WAC-402-52-020(5) does not cover all points under item G. Furthermore, it wrongly suggests that some materials (such as cement and petroleum products) which would not provide sufficient long-term stabilization might be acceptable.

5. Item I -- WAC-402-52-020(3) should be extended to cover those areas on the impoundment which may collect some direct precipitation runoff and drainage.

6. Items K and L - See Comment No. 4, under "Other Comments," below.

Criterion 5:

1. Item A -- WAC 402-52-015(2)(c) inappropriately suggests that seepage can be controlled by locating impoundments away from water courses. WAC 402-52-015(6) has the appropriate wording.

2. Item D -- WAC 402-52-015(6)(b) should include a requirement for consideration of conservation.

** Where mentioned, "item" refers to those items in NRC regulations identified in Attachment.

Criterion 5:

1. Item F -- WAC 402-52-015(2) should be revised to indicate that cover materials of elevated activity are significant only near the surface as written in NRC regulations.

Criterion 8:

1. Item C -- Sections WAC 402-52-025(2) and (3) generally treat the subject of yellowcake stack control. The detail in item C is not provided, however.

Criterion 8a:

1. Item A -- The "regular" inspection required in WAC-402-52-010(5) should be revised to specifically require daily inspections.

Criterion 9:

1. Item A-1 -- Although WAC-402-22-070(6)(b) requires a bond before issuance of a license for a new operation, the requirement is only for receipt prior to issuance of license renewal for existing sites. This is not acceptable as indicated above, under Immediate Action at Existing Sites. It is necessary for mill operators to develop programs meeting the regulations now.

2. Item C -- Although the Washington regulations require a pay-as-you-go fund for long-term site control, the minimum total charge should be covered by the surety amount from the beginning of operations.

3. Items F and G -- Although there is a provision in WAC-402-22-070(6)(b) for review and adjustment of the required bond amount by the State regulatory agency, the specific factors which will be considered in this review and, therefore, which could possibly lead to a revision in the required bond amount, should be addressed.

4. The ability to exempt licensees, new section RCW 70.110 013, is contrary to 10 CFR 40 Appendix A, Criterion 9 which requires surety for each mill operator before operations begin.

Criterion 10:

1. In view of the differing structures of the Federal and State long-term monitoring funds, there is the possibility that, at some time in the future the fixed maximum amount specified in the Washington regulations ($1,000,000) may not be sufficient.

2. Although the Washington regulation (WAC-402-52-020) indicates that no active maintenance can be necessary to preserve isolation, this concept should be explicitly stated where the "Radiation Perpetual Maintenance Fund" is discussed so that the existance of this fund as entitled does not encourage programs which need on-going active maintenance.

Criterion 11:

1. Section RCW 70.121.060 appears to indicate that the State has some discretion concerning the ability of the operator to transfer title. This judgement is reserved by Section 83(b) of the Atomic Energy Act to the Commission.

2. Item A -- The section of the requirement for the license to contain terms to provide for ownership transfer applicable to existing licensees should apply prior to renewal of the license, as stated in WAC-402-22-070(6)(c), and/or prior to termination of the license.

3. New Section WAC 402-22-070(6)(c) provides that the owner, prior to issuance of the license, must agree to transfer title to tailings disposal lands upon license termination. It does not require transfer as a condition precedent to license termination. Under present wording it is at least theoretically possible for the license to terminate and the owner to thereafter breach his agreement to transfer title.

4. New Section WAC-402-22-070(6)(c). New Section WAC 70.110 Sec. 3(b). Exemption from these requirements should run only to lands owned by any Indian Tribe which are subject to a restriction against alienation imposed by the U.S. Exemption for all Indian-owned land is much too broad.

Other Comments:

1. It is not clear that WAC-402-52-015, "Proposed Tailing Disposal Facilities," provides that the requirements, considerations and objectives contained therein are applicable at existing sites as it must. In general, while the alternatives for tailings disposal are more limited at existing sites than at new facilities, evaluation of programs at existing mills must be done in terms of all of the Appendix A to 10 CFR 40 Criteria, except as specifically noted in Appendix A. As described in 45 FR 65524 "Existing Sites" and NUREG-0705 Section 12.4, the determination of the exact extent to which measures are taken to meet Appendix A Criteria at existing mills can only be determined on a site specific basis; general exclusions for existing sites as indicated by WAC-42-52-015 are inappropriate.

2. WAC-402-52-010(2), if kept in final regulations, should go further than it does to prohibit erosion of the tailings retention system and not just of the tailings themselves.

3. WAC-402-52-010(9) should state that the Department cannot waive a requirement which is derived from NRC regulations which are minimum national standards.

4. The NRC staff will review amended Washington regulations to determine that the items identified in the above Table are fully covered in the amended regulations. However, in itemizing Appendix A Criteria as shown in Attachment 2, some of the "fine points" in the Appendix A Criteria are not brought out. The final wording of Appendix A Criteria was carefully worked out after considering numerous public comments on the draft criteria (see Appendix A to NUREG-0706). As a result, in revising its regulations, the State should carefully consider the wording of each of the Appendix A Criteria noted as "covered" in the Table, and where different words are used in State regulations to determine that it is not significant. An example of this is Item A of Criterion 4. The definition of below grade is not included in Washington regulations; this definition was added for clarification to NRC regulations following many comments on the matter in the draft NRC regulations.

Exhibit B

IN THE UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

KERR-McGEE NUCLEAR CORPORATION, et al.,
Petitioners,

v.

NUCLEAR REGULATORY COMMISSION, et al.,
Respondents.

No. 80-2043
And Consolidated Cases

RESPONDENTS' OPPOSITION TO MOTION FOR STAY

On April 27, 1981, petitioners Kerr-McGee Nuclear Corporation, United Nuclear Corporation, and Western Nuclear, Inc., moved this Court to stay the U.S. Nuclear Regulatory Commission's final rule on Uranium Mill Licensing Requirements until judicial review is complete. Respondents oppose that motion.

The NRC's Uranium Mill Licensing Requirements establish a comprehensive regulatory regime for protection of the public health and safety and the environment from hazards associated with the large quantities of mill tailings generated by uranium milling. These regulations were promulgated under the authority provided by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). Pub. L. 95-604, 92 Stat. 3021 (Nov. 8, 1978)

(Appendix A hereto). [1] Congress enacted UMTRCA in recognition of the hazards presented by uranium mill tailings and the need to promptly protect the public from those hazards. Accordingly, it authorized the NRC to regulate uranium mill tailings and sought to ensure essentially equivalent control in Agreement States, see infra pp. 4-5, who wish to continue regulating uranium milling activities. Congress gave those Agreement States until November 8, 1981 to amend their Agreements to comply with the new federal standards set by the NRC. In spite of this clear statutory deadline, petitioners have moved this Court to stay the NRC's regulations until the Environmental Protection Agency promulgates general standards for protecting public health and safety from uranium mill tailings. They also contend that delay is necessary to give them an opportunity to participate in state rulemaking proceedings on the adoption of regulations for uranium mill tailings in Agreement States. Petitioners also assert that they were not given an opportunity to comment on certain technical documents in the record of the NRC rulemaking proceeding. In this opposition, the Commission argues that petitioners have failed to demonstrate any basis for a stay pending judicial review. Petitioners request for a stay should be denied.

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[1] Congress has established authority under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA"), P.L. 96-510 for the Environmental Protection Agency to cleanup and/or seek enforcement action for certain releases from uranium mill tailing sites. See Sections 104, 106(a) and 107(a)(4)(C). The CERCLA authority is in addition to the authority given NRC and EPA under UMTRCA of which Congress was aware when it passed CERCLA. See e.g., Section 101(22).

STATEMENT OF THE CASE

1. Background

Uranium milling is the process of extracting uranium from uranium ore. Because only 1 to 5 pounds of usable uranium can be extracted from each 2,000 pounds of ore, milling produces tremendous quantities of waste called mill tailings. These tailings contain many naturally occurring hazardous substances, both radioactive and non-radioactive. The greatest threat to public health and safety from these wastes is presented by the continuing release of radon-222, a radioactive gas which may cause cancer or genetic mutation. The radioactive decay process generating the radon gas will continue for hundreds of thousands of years. Thus, for all practical purposes, uranium mill tailings present a perpetual hazard which is the major threat to public health and safety from the nuclear fuel cycle.

(?)

Until the early 1970's there was little official recognition of the hazards presented by uranium mill tailings. Even though most of the tailings had been produced under government contract to supply uranium for the AEC, federal regulation of the industry had been minimal. As a consequence mill tailings were left at sites, mostly in the Southwest, in an unstabilized and unprotected condition. Some of the tailings were used for construction purposes in the foundations and walls of private and public buildings, increasing substantially the public exposure to radon gas.

In 1971 Congress began to investigate the dangers presented by the use of uranium mill tailings for construction purposes, and in 1972 passed legislation authorizing the Federal Government, in cooperation with the State of Colorado, to devise a program to remove tailings from places in Grand Junction, Colorado, where they constituted a threat to public health. See generally H. Rep. No. 95-1480, Part I, 95th Cong., 2d Sess. pp. 11-12 (1978).

At about this time public and Federal attention began to focus on regulation of the active commercial uranium milling industry. Since mill tailings were not themselves licensable material, the Atomic Energy Commission, and its successor the Nuclear Regulatory Commission, did not have direct regulatory authority over the tailings. Regulatory control was exerted indirectly over active mills as part of the Commission's licensing authority over source material, the uranium ore used in the milling process. However, where milling operations had been ended, the Commission had no power over the abandoned tailings. See generally Hearings Before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs, 95th Cong., 2d Sess. 75-77 (1978).

The regulatory structure was further complicated by the role played by Agreement States. Section 274, enacted in 1959 as an amendment to the Atomic Energy Act of 1954, permits the Commission to cede to the States jurisdiction to regulate source, byproduct, and small quantities of special nuclear materials. 42

U.S.C. 2021. [2] Under a State Agreement, the Commission relinquishes a portion of what had been its exclusive preemptive federal jurisdiction over those nuclear materials (such as the source material, uranium), and the State, under its police powers, assumes jurisdiction. Twenty-six States have entered into agreements with the NRC; however, only four of these States -- Washington, New Mexico, Texas and Colorado -- are currently involved in the licensing of uranium milling. All uranium producing States whether or not they had entered into agreement with the NRC could regulate uranium mill tailings under the States inherent policy powers, since the Commission did not have direct licensing authority over that waste product.

The Commission's regulation of active mills gained momentum in the mid-1970's. In May, 1975, the Natural Resources Defense Council petitioned the Commission to prepare a generic environmental impact statement to evaluate the regulatory programs for uranium milling at both the Federal and State levels, and to adopt improved regulations for milling operations. The Commission undertook that evaluation, and as it did so it moved to upgrade its regulation of mill tailings management at NRC licensed active mills. [3] As licenses were renewed or amended, license conditions were added to require control over the blowing of mill tailings, and seepage from mill tailings piles into the groundwater. In addition, licensees committed to a program for the long-term management of tailings piles by covering them with sufficient earth to eliminate particulate releases and gamma radiation, and to reduce radon releases to low-levels. Licensees also provided financial arrangements to ensure that the tailings programs would be carried out. Since 1977, all operators of new mills licensed by the NRC have committed to tailings management and disposal programs based on performance objectives similar to those in the Requirements, and operators of existing mills have committed to upgrading their operations to meet the performance objectives that could be applied to active mill sites. Similar progress has been made in upgrading Agreement States regulation of new uranium mills licensed in those states since 1978. In April 1978, the Commission initiated a program of technical assistance to Agreement States for their conduct of environmental assessments of uranium mills. 43 Fed. Reg. 17879 (April 29, 1978). Under this program, the NRC provided Agreement States with reports on the environmental impacts of uranium milling and mill tailings disposal. The Agreement States used those reports as the basis for requiring tailings management programs for those new mills.

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[2] The exceptions are not relevant here. They related to matters which Congress specified could not be relinquished to the States such as exports of source material, and regulation of nuclear power plants and fuel fabrication plants.

[3] See e.g., Branch Position -- Uranium Mill Tailings Management (May 3, 1977).

But large gaps still existed. Most particularly, the regulatory gaps concerned abandoned mill tailings at inactive sites, a mechanism to require minimum and uniform standards over the mill tailings generated by existing mills in Agreement States, and arrangements for long term control of tailings piles. The forces to close these regulatory gaps coalesced in 1978 as the Congress learned of the full extent of the cleanup problem at the abandoned mill sites -- a cost to the Federal Government of approximately $180 million -- and with a sense of urgency committed itself not to repeat the errors of the past. The Commission also had concluded that it should seek legislation to make tailings licensable material so that the Commission could exert direct regulatory control over mill tailings. See generally H. Rep. No. 95-1480 Part 1, 95th Cong., 2d Sess. at 12 (1978). At about the same time, the Commission was nearing completion of its draft generic environmental impact statement on uranium milling which together with its licensing experience would form the basis for a uniform regulatory structure.

2. The Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA")

Congress responded to these concerns by enacting the Uranium Mill Tailings Radiation Control Act of 1978. The UMTRCA had two broad purposes. In Title I Congress established a remedial action program to provide for the cleanup of some 27 million tons of tailings at inactive and abandoned mill sites. In Title II Congress clarified and reinforced the NRC's authority to regulate uranium milling and mill tailings, and sought to ensure essentially equivalent regulatory standards in Agreement States. H.R. Rep. No. 95-1480, Part I, 95th Cong., 2d Sess. 11-13 (1978). UMTRCA, Sec. 2.

With respect to Title II, which is the focus of this lawsuit, UMTRCA amended the Atomic Energy Act of 1954 to define uranium mill tailings as a licenseable material, 42 U.S.C. 2014.e.(2), and authorized the NRC to ensure that the management of uranium mill tailings is carried out in a manner the Commission deems appropriate to protect the public health and safety and the environment from radiological and non-radiolgoical hazards associated with the processing, possession, and transfer of such material. 42 U.S.C. 2114.a.(1). In addition to this broad grant of authority to the Commission, UMTRCA also authorized the Commission to promulgate regulations for the decontamination, decommissioning, and reclamation, of tailings disposal sites; for the provision of financial arrangements to ensure licensee performance of these activities as well as to provide for any long-term funding considered appropriate; and for ultimate ownership of disposal sites by either state or federal government. See 42 U.S.C. 2113.a, 2021.x.(1) and 2133.b.

UMTRCA also authorized the Administrator of EPA to promulgate no later than April 8, 1980 standards of general application for the protection of the public health and environment from the radiological and non-radiological hazards associated with the processing, possession, transfer and disposal of mill tailings at active piles. 42 U.S.C. 2022.b.(1). These EPA standards were not to include detailed or site specific requirements nor any requirements which would duplicate NRC regulatory authority for activities concerning uranium mill tailings. H.R. Rep. No..95-1480, Part 1, 95th Cong., 2d Sess. at 17 (1978). Once the EPA standards become effective, the NRC and the Agreement

States are responsible for their implementation and enforcement. 42 U.S.C. 2022.d. and 2021.o.(2).

3. NRC Rulemaking

To implement its responsibilities under UMTRCA, the NRC carried forward a rulemaking proceeding that culminated in the Uranium Mill Licensing Requirements that are at issue here. The NRC rulemaking was founded upon its exhaustive draft Generic Environmental Impact Statement (GEIS) on uranium milling which examined uranium mill tailings conditions in both Agreement and non-Agreement States. The draft GEIS was published for public comment in April 1979; and a proposed rule was issued on August 24, 1979. 44 Fed. Reg. 50012-22. The NRC also held public hearings in Denver and Albuquerque (both cities are in Agreement States) in October, 1979. Some 99 written submittals were received from individuals, uranium milling companies, trade associations, state and Federal agencies, and conservation and public interest groups. The NRC staff systematically reviewed all comments received and the transcripts of the statements presented at the public hearings. In September, 1980 after evaluating approximately 1500 substantive comments on the draft GEIS and proposed rule changes the NRC issued the Final GEIS, and on October 3, 1980 issued the final rule 45 Fed. Reg. 65521, et seq.

In the Statement of Considerations accompanying the final rule the NRC found that UMTRCA required the Commission to act with dispatch to ensure that the management of uranium mill tailings is carried out in a matter that will protect the public health, safety and the environment. A number of commenters had taken the position that there is no great sense of urgency for regulations on uranium mill tailings management and mill operations. The Commission rejected that position.

> [E]ach year new mills are proposed and many millions of tons of tailings are generated at existing mills. As new mills are constructed and more tailings are generated, the options for dealing with tailings disposal become fewer. It is critically important that the siting and design criteria of the regulations be implemented for new facilities so that mistakes of the past are not repeated. In addition, and perhaps even more important, radioactive releases from existing mills constitute the largest potential routine releases from the nuclear fuel cycle. Therefore, it is absolutely essential that regulations, which assure that action is taken to protect the public health and safety, are promulgated promptly.

45 Fed. Reg. 65523. The Commission also found, contrary to the position of some commenters, that nothing in UMTRCA or its legislative history requires the NRC to defer its regulations until EPA acts. The Commission's authority under UMTRCA extends beyond enforcement of EPA standards issued under Section 275 of the Act, and explicitly includes Commission authority to ensure that the management of uranium mill tailings is carried out in such a manner as the Commission deems appropriate to protect the public health and safety and the environment. UMTRCA Section 205(a), P.L. 95-604, 92 Stat. 3039, 95th Cong., 2d Sess. (Nov. 8, 1978), 42 U.S.C. 2014(a)(1). Moreover, Section 83 of the Act as added by UMTRCA provides that the Commission shall establish license terms and conditions it determines necessary to assure that licensees will

comply with "decontamination, decommissioning, and reclamation standards prescribed by the Commission." 42 U.S.C. 2113.a. Finally, the NRC noted that it was clear from the statutory scheme applicable to the Agreement States that the NRC's standards were to be promulgated as promptly as possible so that Agreement States could meet the statutory November 8, 1981 deadline. Final GEIS on Uranium Milling, NUREG-0706, Vol. II, A-87-88 (September 1980), 45 Fed. Reg. 65521 at 65523 (October 3, 1980). [4]

The NRC also addressed the compatibility of its Requirements with the not yet proposed EPA standards. The Commission was aware of the fact that its regulations must be compatible with those of EPA. For that reason there had been close coordination between the NRC and EPA staffs. Moreover, differences would also be minimized because UMTRCA requires EPA to consult with NRC before issuing its standards. The staffs of the two agencies would continue to co-ordinate their actions with one another.

4. Coordination With Agreement States

As noted earlier, supra p. 6, even before Congress began considering UMTRCA, the NRC's Office of State Programs had been working closely with the Agreement States to upgrade their regulation of uranium milling and mill tailings. In addition to assistance on specific licensing actions, the Commission had conducted workshops in Agreement States on uranium mill licensing practices. With the advent of UMTRCA that effort was carried forward. Section 207 of UMTRCA authorized the NRC to give grants to Agreement States to aid in the development of States regulatory programs which implement the provisions of that Act; and the NRC gave such grants to all of the states which expressed an interest in continuing their regulation of uranium milling past the Congressional deadline of November 8, 1981. Moreover, the NRC continued working actively with representatives of Agreement States which wanted to amend their agreements to include the regulation of milling and mill tailings. In December 1978, the Commission held a workshop in Colorado Springs for Agreement States to review a preliminary draft of the GEIS. NRC staff members testified in May 1979 in a New Mexico rulemaking hearing on uranium mill regulation. The NRC Office of State Programs in October 1979, provided Agreement States with a Draft Model State Act entitled "Uranium Mill Tailings Radiation Control Act." The Model Act gave the states guidance on amending their existing statutory framework to retain or receive authority over uranium milling operations. In December 1979, the NRC informed Agreement States of the kind of independent assessments of uranium mills NRC would consider adequate under UMTRCA. In July 1980, the NRC sent the Agreement States draft criteria which the NRC proposed to use in determining how each state's program should be amended to comply with UMTRCA, and provided a preliminary evaluation of each state's compliance status.

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[4] The timing of NRC regulations is also consistent with the plan developed by the Interagency Review Group on Waste Management. The Report to the President by the Interagency Review Group on Nuclear Waste Management, 147 (March 1979), which was developed prior to UMTRCA, contemplated NRC's promulgation of final regulations by early 1980 and EPA's promulgation of final standards by late 1985. See Final GEIS on Uranium Milling, Vol. I, 13-5 (September 1980), 45 Fed. Reg. at 65523 (October 3, 1980).

Early in 1981, the NRC staff sent "report cards" to the Agreement States informing them of their progress towards acceptable amended agreements and describing the additional steps necessary to achieve compliance with the NRC's Requirements. Those letters suggested a target date of Summer, 1981, for an Agreement State to formally submit its application for amendment to the NRC. Some of these states, including Colorado and Nevada included timetables that provided for public participation in State proceedings on those amendments, and predicted State adoption by November 8, 1981 as required by UMTRCA. The NRC is continuing to work with Agreement States on the implementation of amendments necessary for compliance with UMTRCA.

ARGUMENT

In order to obtain a stay, petitioners must satisfy a fourfold test: (1) that they are likely to prevail on the merits; (2) that they will suffer irreparable harm without a stay; (3) that other interested parties would not be substantially harmed by a stay; and (4) that the public interest supports a stay. _Lundgrin_ v. _Claytor_, 619 F.2d 61 (10th Cir. 1980); _Virginia Petroleum Jobbers Ass'n_ v. _FPC_, 259 F.2d 921, 925 (D.C. Cir. 1958); _Washington Metropolitan Area Transit Commission_ v. _Holiday Tours_, 559 F.2d 841, 843-44 (D.C. Cir. 1977). They must in short show that it is probable that they will ultimately prevail and that there is probable danger if a stay is not granted. Ludgrin v. Claytor, supra, 619 F.2d at 63. Petitioners have utterly failed to sustain their burden. Accordingly, their motion should be denied.

Petitioners' argument on the merits is threefold: (1) the Commission is not entitled to issue its UMTRCA regulations prior to promulgation by EPA of its general standards; (2) the Agreement States have not been afforded sufficient time to promulgate their own set of implementing regulations, thus undermining petitioners' right to comment on the State regulations; and (3) the Commission in issuing its UMTRCA regulations improperly considered documents submitted after the comment period on its regulations had closed, again undermining petitioners' right to comment. We will respond to each argument in turn.

A. Probability of Success on the Merits

1. The Commission Need Not Await Issuance of EPA Standards

Petitioners interpret UMTRCA to require the NRC to delay promulgation of the Uranium Mill Licensing Requirements (Requirements) until EPA issues standards of general application for the protection of the public health, safety, and the environment from radiological and non-radiological hazards associated with uranium mill tailings (Standards). The argument is without merit. No language in the statute, nor legislative history supports it. Congress contemplated prompt regulatory action by the Commission leading to adoption by the Agreement States of like or more stringent regulations no later than November 8, 1981. There is no hint in the UMTRCA or its history that Congress wanted that overriding purpose deferred pending EPA issuance of general standards. It was clear throughout, that Congress expected the Commission and EPA to continue their historical regulatory roles with respect to one another, a relationship where traditionally Commission regulation has preceded that of EPA's. This was especially true in the uranium mill tailings area where Congress was aware of the considerable steps the Commission had already taken to develop a comprehensive regulatory regime that could be applied both to Commission licensees and to mill operators in Agreement States.

First, it is worth noting that UMTRCA does not by its terms require the Commission to defer its regulatory action pending issuance of EPA standards. The omission of an explicit direction for the Commission to abide the event of EPA action is particularly compelling that the Commission need not, for in the very same statute, Title I of UMTRCA, Congress explicitly provided that the Department of Energy was not to undertake the cleanup of the abandoned mill sites until EPA had first issued standards governing that activity. Section 108(a) of UMTRCA, 92 Stat. 303, provides:

> (2) The Secretary [of Energy] shall use technology in performing such remedial action as will insure compliance with the general standards promulgated by the Administrator [of EPA] under section 275a. of the Atomic Energy Act of 1954 and will assure the safe

> and environmentally sound stabilization of residual radioactive materials, consistent with eixsting law. No such remedial action may be undertaken under this section before the promulgation by the Administrator of such standards. (Emphasis added.) 42 U.S.C. 7918.

The difference in treatment between the Department of Energy's remedial action in Title I and the Commission's regulatory actions under Title II was not inadvertent. Throughout Congress' consideration of the UMTRCA, the Environmental Protection Agency distinguished between standards for remedial action which the agency thought it would be able to promulgate relatively quickly, within six months of passage, and standards relating to tailings from active mills which the agency thought would be years off and would benefit from the Commission's particularized experience in regulating uranium mills and their tailings. See generally, Hearings before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 95th Cong., 2d Sess. 368, 387-88, 391-92, 395-96 (1978); Hearings before the Subcommittee on Energy Production and Supply of the Senate Committee on Energy and Natural Resources, 95th Cong., 2d Sess. 58 (1978). 5/ While Congress in Section 206 of UMTRCA tried to prod

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5/ William D. Rowe, Deputy Assistant Administrator for Radiation Programs, and EPA's principal witness at the congressional hearings, was explicit that NRC should proceed to issue its mill tailings regulations after consultation with EPA but in advance of EPA's standards. The EPA standards he considered to be several years away, and in need of more technical information which would be generated both from NRC licensing actions and from the remedial action program. House Hearings at 386-387; 391-92. Hearings before the Subcommittee on Energy Production and Supply of the Senate Committee on Energy and Natural Resources, 95th Cong., 2d Sess. 58 (1978). That kind of an approach was not viewed as threatening inconsistent regulatory action. See House Hearings at 387.

EPA into speedier action on its generalized standards it did not burden the Commission to await EPA's actions. [6] 42 U.S.C. 2022.b(1).

It is also plain from the legislative history of UMTRCA that Congress intended the Commission to be the lead federal agency in regulating uranium mill tailings and that Congress sought to preserve the traditional regulatory relationship between NRC and EPA, a relationship where again NRC has not been constrained to await EPA issuance of general standards. Without quarrel from any quarter all agreed that the NRC should be the principal regulator of mill tailings and be given specific licensing authority over mill tailings while EPA should have authority to promulgate general environmental standards for mill tailings consistent with its authority under Reorganization Plan No. 3 of 1970. [7] NRC was also to have the additional authority of enforcing the EPA standards. See generally Hearings before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 95th Cong., 2d Sess., at 192, 217, 233, 343, 366 (1978). The House Report from the Committee on Interior and Insular Affairs summarized the respective lines of authority as follows. H. Rep. No. 95-1480, Part I, 95th Cong., 1st Sess. at 15-17 (1978):

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[6] EPA has had a history of missing statutory deadlines. See e.g., NRDC v. Train, 510 F.2d 692 (D.C. Cir. 1977) and pp. 19-20, *infra*.

[7] Reorganization Plan No. 3 of 1970 (Plan) transferred to EPA the AEC's authority to establish generally applicable environmental standards for the protection of the general environment from radioactive materials. However, as noted in the President's message transmitting the Plan to Congress, the AEC remained responsible for enforcing the standards. This allocation of agency responsibilities was memorialized in a Memorandum of Understanding between the AEC and EPA entered into in 1973. 38 Fed. Reg. 24936 (September 14, 1973). Those enforcement responsibilities are now vested in the NRC as the successor to the AEC's licensing authority. 42 U.S.C. 5841(f).

> AUTHORITY OF THE NUCLEAR REGULATORY COMMISSION
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> The Commission, in keeping with its responsibilities and authorities under the Atomic Energy Act and the National Environmental Policy Act, is the lead agency in regulation, oversight, and management of uranium mill tailings-related activities. It is one of the major purposes of H.R. 13650 to clarify and reinforce these Commission responsibilities, with respect to uranium mill tailings at both active and inactive sites.
>
> In establishing requirements or promulgating regulations for licensing or for oversight of the Department's remedial activities, the Commission must set all standards and requirements relating to management concepts, specific technology, engineering methods, and procedures to be employed to achieve desired levels of control for limiting public exposure, and for protecting the general environment. The Commission's standards and requirements should be of such nature as to specify, for example, exclusion area restrictions on site boundaries, surveillance requirements, detailed engineering requirements, including lining for tailings ponds, depth, and types of tailings covers, population limitations, or institutional arrangements such as financial surety requirements or site security measures. The Commission should issue all necessary permits or licenses for uranium mill tailings sites.
>
> The NRC is also responsible for implementing general standards and criteria promulgated by the Administrator of the Environmental Protection Agency. NRC must assure that the technology, engineering methods, operational controls, surveilliance requirements, and institutional arrangements employed at the sites provide the necessary barriers and levels of control to limit public exposure, and protect the environment from radiological and toxic nonradiological substances associated with uranium mill tailings materials, as specified by the EPA standards and criteria.

> With respect to nonradiological matters, the NRC, through its environmental review under the NEPA mandate, would impose controls consistent with those imposed by EPA on similar materials contained in other solid wastes subject to EPA authority.
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> * * * *
>
> AUTHORITY OF THE ENVIRONMENTAL PROTECTION AGENCY
>
> It is the responsibility of the Environmental Protection Agency to establish generally applicable standards and criteria for the protection of the general environment, considering radiological and nonradiological aspects of tailings. The EPA standards and criteria should be developed to limit the exposure (or potential exposure) of the public and to protect the general environment from either radiological or nonradiological substances to acceptable levels through such means as allowable concentrations in air or water, quantities of the substances released over a period of time, or by specifying maximum allowable doses or levels to individuals in the general population. The EPA standards and criteria should not interject any detailed or site-specific requirements for management, technology or engineering methods on licensees or on the Department of Energy. Nor should EPA incorporate any requirements for permits or licenses for activities concerning uranium mill tailings which would duplicate NRC regulatory authority over the tailings sites.

The plain congressional understanding was for NRC to be "the lead agency in regulation, oversight and management of uranium mill tailings-related activities" while EPA had the responsibility, consistent with Reorganization Plan No. 3 of 1970, to establish generally applicable standards and criteria for the protection of the general environment. Id. at 15. Petitioners' argument that the Commission was to take a back seat until EPA issued its generally applicable standards is wholly at odds with the congressional understanding that the Commission was to be the lead agency in regulating mill tailings. Their position is also at odds with the historical relationship between NRC and EPA. As a matter of historical practice, the NRC has not deferred or delayed its regulation of radioactive effluents pending EPA's promulgation of general standards. For example, the NRC published a major rule limiting radioactive materials effluents from nuclear power reactors on May 5, 1975. 10 CFR Part 50, Appendix I. More than 18 months later, EPA published a rule setting environmental radiation protection standards for nuclear power operations. 40 CFR Part 190. Again, the Resource Conservation and Recovery Act of 1976 (RCRA) authorized EPA to regulate hazardous wastes excluding licenseable material under the Atomic Energy Act. 42 U.S.C. 6901 et seq. Prior to the enactment of UMTRCA, mill tailings were not licenseable material under the Atomic Energy Act and could have been regulated by EPA under RCRA. Although EPA did not exercise its authority under RCRA, the NRC regulated mill tailings at active uranium mills. 42 U.S.C. 2093. Similarly, under the Clean Air Act amendments of 1977 EPA is to determine whether radioactive emissions cause or contribute to air pollution and, if so, to list them as substances to be regulated under the Clean Air Act. 42 U.S.C. 7401 et seq. Although EPA listed radionuclides as hazardous air pollutants on December 27, 1979, 44 Fed. Reg. 76738, it has not yet issued standards for radionuclide emissions, and NRC continues to regulate radioactive releases into the air under 10 CFR Part 20 and 10 CFR Part 50 Appendix I.

Lastly, petitioners' contention that the Commission was to await promulgation of EPA standards is wholly unreasonable because it would thwart Congress' overriding intention to subject all uranium mill tailings at active mills to regulation in accordance with Commission standards by November 8, 1981. Section 204(h) of UMTRCA, 92 Stat. 3038, as amended by Section 22 of the Surface Transportation Assistance Act of 1978, Pub. L. No. 96-106, 93 Stat. 799-800 (1979). Congress was aware of the fact that since the mid-1970's the Commission has been continually upgrading its standards for uranium mill licensing. See generally Hearings before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 95th Cong., 2d Sess. 226-231, 341 (1978); Hearings before the Subcommittee on Energy and Environment of the House Committee on Interior and Insular Affairs, 95th Cong., 2d Sess. 75-76 (1978). Through its licensing actions and its work on the generic environmental impact statement on uranium mill tailings the Commission had developed a body of expert knowledge which the Congress wanted and expected to see in place in the form of binding regulations so that the mistakes of the past which necessitated Congress' enactment of a major remedial program at the 22 inactive sites would not be repeated. As the House Report put it:

> The draft generic enviornmental impact statement on uranium milling regulation, and proposed new milling regulations, are expected to be completed by NRC this year. But the steps which have been taken to control future uranium milling operations do not remedy existing public health hazards resulting from the unstabilized piles of wastes produced in prior decades.
>
> In 1974 Congress requested the Energy Research and Development Administration to survey and assess the problem presented by the tailings located at 22 sites throughout the Southwest. On the basis of the resulting studies, the administration proposed legislation this year to authorize a remedial program similar to

> that implemented at Grand Junction, Colo., to clean up existing inactive sites. The cost of the program to the Federal Government is expected to be $180 million. To prevent any future occurrence of a situation of this kind the Nuclear Regulatory Commission was asked by the chairman of the Committee on Interior and Insular Affairs, Representative Morris K. Udall, to submit draft legislation providing it with necessary authority to comprehensively regulate the uranium mill operations and activities. This draft legislation was introduced and considered by the committee in developing its recommendations.
>
> Without the authorities included in H.R. 13650, the conditions addressed by the remedial program would be left without remedy and the authority of the Commission to establish uniform rational (sic) standards for waste disposal from uranium mills would not be clear. H. Rep. No. 95-1480, Part I, 95th Cong., 2d Sess. at 12 (1978).

Congress' insistence that the Commission was to develop uniform national regulations, its understanding that those regulations would be proposed that year or in the near future, and Congress' conclusion that the way to prevent a recurrence of past errors was to empower the Commission to comprehensively regulate uranium mill operations and activities through uniform national standards, is compelling evidence that Congress did not intend the Commission to sit back and await promulgation of EPA standards.

2. The Commission Has Not Illegally Truncated Petitioners Time to Comment

Petitioners argue that the Commission has short-circuited their ability to comment on the regulations to be issued by the Agreement States by taking the position that the Commission's regulations are minimum national standards which are practicable for the Agreement States to adopt. [8] The short answer to petitioners' argument is that the issue is not presented in this case. The Commission's UMTRCA regulations were issued October 3, 1980. 45 Fed. Reg. 65521. The Agreement States must have their implementing regulations in place by November 8, 1981, if they are to continue regulating uranium mill tailings. Section 204(h) of UMTRCA, 92 Stat. 3038, as amended by Section 22 of the Surface Transportation Assistance Act of 1978, Pub. L. No. 96-106, 93 Stat. 799-800 (1979). Thus the Agreement States will have had three years since UMTRCA was enacted, and more than 13 months since the Commission's regulations were issued, in order to promulgate implementing regulations. That time period is sufficient for petitioners to be fully heard by the Agreement States on their contentions as to what the Agreement State implementing regulations should look like. If the Agreement States do not accept petitioners' arguments and instead enact regulations acceptable to the Commission, judicial review will be available to petitioners at that time and the court will have a concrete case to decide.

Moreover, as noted earlier, pp. 5-6, 11-13, supra, throughout this time, and even before, there has been extensive cooperation and consultation between the NRC and the Agreement States, and industry as well, regarding uranium mill licensing requirements. By the time the Commission issued its UMTRCA requirements in October, 1980, progress had already been made in implementing many of the changes that must be in place by November 8, 1981, for the Agreement States to continue their regulation of uranium mill tailings. Petitioners' claim that the UMTRCA requirements are being imposed with unseemly haste in contravention of their right to comment is frivolous. [9]

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[8] In petitioners' view Section 204(e)(1) of UMTRCA, 92 Stat. 3037, which requires Agreement States (who wish to regulate uranium mill tailings after November 8, 1981), to adopt standards "which are equivalent, to the extent practicable, or more stringent than standards adopted and enforced by the Commission" affords the States wide discretion to decide upon the kind of regulatory scheme to adopt. We respond to the merits of that argument infra, pp. 24-28.

Petitioners' arguments are without merit for another reason as well. The premise of their argument for more time is their contention that Congress intended the Agreement States to exercise broad discretion in deciding what aspects of the Commission's UMTRCA regulations to enact, and that the exercise of this broad discretion calls for a re-working of all that has already been done in the GEIS and the comments on the UMTRCA regulations. There is no merit to that position.

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[9] Petitioners' argument that Congress intended to give Agreement States at least 18 months from passage of UMTRCA to adopt regulations is also inconsistent with its argument that the NRC should have waited until after EPA issued its standards. Had EPA issued its standards in 18 months as Congress provided, the Commission would have had to issue its UMTRCA regulations simultaniously with EPA's, not afterwards, for the Agreement States to have had 18 months for their own regulations and meet the 3-year November 8, 1981 statutory deadline.

UMTRCA does not specify any fixed time for the Agreement States to implement the Commission's regulations. As we have argued in text, the time afforded has been sufficient.

First, Congress explicitly provided in the same section of UMTRCA that calls upon the Agreement States to adopt standards "which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission" that "[n]o State shall be required . . . to conduct proceedings concerning any license or regulation which would duplicate proceedings conducted by the Commission." Section 204(e)(1) of UMTRCA, 92 Stat. 3037, 3038. Plainly Congress did not expect the States to re-work the Commission's extensive inquiry into uranium mill tailings hazards and their control. Second, Congress made crystal clear its intent that the Commission's UMTRCA regulations were to be minimum national standards, and that the "practicality" language in the statute was not meant to afford Agreement States discretion to ease the Commission's substantive regulations. Thus, in explaining the intent behind Section 204 the House Report from the Committee on Interior and Insular Affairs placed no emphasis on the "practicality" qualifier.

> Without the authorities included in H.R. 13650, the conditions addressed by the remedial program would be left without remedy and the authority of the Commission to establish uniform rational (sic) standards for waste disposal from uranium mills would not be clear.
>
> * * * *
>
> Title II clarifies and reinforces the authority of the Nuclear Regulatory Commission to regulate the production and disposal of uranium mill tailings at active sites, and provides for the application of minimum Federal standards to such activities in States which regulate them under authority permitted by the Atomic Energy Act.
>
> * * * *

> Subsection (g) requires the Commission to review the regulatory programs of each Agreement States (sic), as soon as practicable 3 years after the date of enactment of the act, to determine whether the standards applied by the State are at least equivalent to those of the Commission. If the Commission determines that the State's program does not comply, it may suspend or terminate that part of its agreement with the State under which the State is permitted to license and regulate uranium milling and mill tailings activities. Regulatory authority would then revert to the Commission. (Emphasis added).

H. Rep. No. 95-1480, Part I, 95th Cong., 2d Sess. (Aug. 11, 1978).

The Report from the Committee on Interstate and Foreign Commerce was to the same effect.

> This title amends the Atomic Energy Act of 1954. It reinforces the authority of the Nuclear Regulatory Commission to regulate the uranium mill process and mill tailings disposal. The "Agreement States" program, under which certain States license uranium milling activities, is modified to require that State licensing standards be equivalent to those of the Commission, and it requires public participation and environmental review as part of the State licensing procedures. Title II also reinforces the NRC's authority to make financial arrangements with uranium milling companies to insure proper stabilization and care of uranium mill tailings.
>
> * * * *
>
> Subsection (g) requires the Commission to review the regulatory programs of each Agreement States, (sic) as soon as practicable 3 years after the date of enactment of the act, to determine whether the standards applied by the State are at least equivalent to those of the Commission. If the Commission determines that the State's program does not comply, it may suspend or terminate that part of its agreement with the State under which the State is permitted to license and regulate uranium milling and mill tailings activities. Regulatory authority would then revert to the Commission. (Emphasis added)

H.R. Rep. 95-1480, Part 2, 95th Cong., 2d Sess. 43, 45 (1978).

The Congressional debates mirrored the understanding of the Committee reports. [10] For example, Mr. Wallop stated:

> The Agreement States would be required to follow at a minimum any Federal substantive standards. 124 Cong. Rec. S. 18,750, Col. 3 (October 13, 1978) (daily ed.)

And Mr. Dingell stated:

> The House provisions sought to make it clear that mills located in Agreement States would be treated no differently than those located in other States where NRC is the regulator. For competition reasons alone, we believe that this approach was sought. 124 Cong. Rec. H. 12,968, Col. 2 (October 14, 1978) (daily ed.)

In view of this Congressional emphasis on minimum federal standards to provide for the uniform regulation of uranium mill tailings, it is unreasonable to interpret UMTRCA as authorizing the states independently to determine the extent to which their implementation of NRC Requirements would be practicable. And the legislative record most plainly shows that extended State proceedings to implement the Commission's UMTRCA regulations were not contemplated. Petitioners have not had their ability to comment on the State implementing regulations unfairly truncated.

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[10] In addition, Mr. Lagomarsino went on record as follows:

> It is my understanding that Title II of this bill [H.R. 13650] will clarify the authority of the Nuclear Regulatory Commission to regulate the uranium milling process and disposal of mill tailings, and that States authorized to license uranium milling through agreements with the NRC will be required to adopt control standards equal to or exceeding the Federal Stadnards. 124 Cong. Rec. H. 11,371 Col. 1 (October 3, 1978).

And Mr. Sharp went on record as follows:

> [Title II] provides for comparable standards and control by Agreement States so that all mills will be treated alike and regulated fully. 124 Cong. Rec. H. 11,372, Col. 1 (October 3, 1978) (daily ed.)

The NRC's determination that its Requirements are practicable for Agreement States is reasonable and adequately supported by the record. In developing its Requirements, the NRC considered operations and conditions in both Agreement and non-Agreement States. As early as 1976, the Commission indicated that determinations on needed uranium mill regulatory program changes was to consider "[i]nformation pertinent to the environmental impact from uranium milling operations in both Agreement and non-Agreement States..." (Commission Statement of Intent To Prepare GEIS, 41 Fed. Reg. 22430). The following year (March 14, 1977), the Commission reaffirmed its intention to "address conventional uranium milling operations in both Agreement and non-Agreement States..." through issuance of its proposed scope and outline for the generic environmental impact statement (42 Fed. Reg. 13874). Subsequently, in developing the basis for the Requirements, the NRC did, in fact, consider operations and conditions in both Agreement and non-Agreement States. The full range of factors which vary from site to site and region to region were identified. These included, for example, soil types, ore grade, and size of tailings piles. The cost and degree of difficulty in meeting requirements under these various conditions were also evaluated. I GEIS Chapter 9.3.8, 12.3 (1980). On the basis of this comprehensive analysis, the NRC developed Requirements that it believes are practicable for both Agreement and non-

Agreement States. Under these conditions, and the clear Congressional desire for uniform regulation, the NRC acted reasonably in determining that its Regulations are practicable federal standards and should be implemented by November 8, 1981.

3. The Inclusion of Late Comments in the Record is not a Basis for a Stay

Finally, petitioners argue that the Commission's uranium mill requirements should be stayed because certain documents listed on the certified index of the record were not available until after the comment period closed. The argument is without merit. Petitioners have not shown how their comments would have changed had the documents been available during the comment period, and in any event the documents are not basic to the Commission's rule. Sierra Club v. Costle, No. 79-1565, slip op. pp. 195-202 (D.C. Cir. April 29, 1981); B.F. Goodrich v. Dept. of Transportation, 541 F.2d 1178, 1184 (6th Cir. 1976); cf. United States v. Nova Scotia Food Products Corp., 568 F.2d 240 (D.C. Cir. 1977).

The Administrative Procedure Act's notice and comment rulemaking requirement, 5 U.S.C. 553(c), obligates an agency to give notice of the facts it considers critical or of central importance to its proposed rule so that a person may meaningfully comment on them. Portland Cement Assoc. v. Ruckelshaus, 486 F.2d 375 (D.C. Cir. 1973), cert. denied, 417 U.S. 921 (1974). That opportunity for meaningful comment has never been interpreted to require an agency to give notice of and an opportunity to comment on every piece of information or data it considers in promulgating a rule. Sierra Club v. Costle, No. 79-1565, slip op. pp. 195-202 (D.C. Cir. April 29, 1981); B.F. Goodrich Co. v. Department of Transportation, 541 F.2d 1178, 1184 (6th Cir. 1976). As long as the basic data on which the agency relied in formulating the regulation was available for comment, the agency's action will be upheld. 11/ Id. at 1184; 1 Davis, Administrative Law Treatise (2d Ed. 1978), p. 582. The cases on which petitioners rely are factually very different from this case and involve instances of agencies not disclosing the basic data on which their regulations rested.

There is no question in this case that the basic data upon which the Commission relied for its uranium mill requirements was available to petitioners and they had full opportunity to comment. See Affidavit of Hubert J. Miller, Exhibit 1. The documents petitioners criticize the Commission for including in the certified index corrobrated or supplemented information already available for public comment. None of the references cited are required to support points in the regulations, nor are they funda-

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11/ Basic data is that which is indispensable or fundamental, something which forms the essence of. (See Webster's Third New International Dictionary, p. 181.) The legal test has also been phrased in terms of making available the "critical" facts or those of "central importance". Sierra Club v. Costle, ___ F.2d ___, supra, slip op. p. 195, n.484 and p. 198.

mental to the regulations. Affidavit of Hubert J. Miller. [12] The basic data in support of the rule is presented in the draft Generic Environmental Impact Statement on Uranium Milling, NUREG-0511. Petitioners had every opportunity to comment on the GEIS. The draft GEIS was published for comment in April, 1979, see 44 Fed. Reg. 24943, and the proposed regulations were published for comment in August, 1979. 44 Fed. Reg. 40013. The Commission extended the comment period of the draft GEIS from July 26, 1979 until September 24, 1979 at the request of an industry representative to allow for still further comment. See Exhibits I and J to Petitioners' Motion for a Stay Pending Review. In addition, the Commission held public hearings on the draft GEIS and the proposed regulations in October, 1979, in Denver, Colorado and Albuquerque, New Mexico, again facilitating public comment, especially by those in Agreement States. The basic data upon which the challenged regulations were founded was fully available for comment. Indeed petitioners make no claim to the contrary. [13] Petitioners have made no showing whatsoever that they were prevented from presenting their case to the Commission. In fact, as indicated in the record, the petitioners actively participated in the NRC rulemaking proceeding through the submission of hundreds of pages of comments and lengthy oral presentations at each of the public hearings. All of the petitioners' substantive comments were considered and responded to in the preparation of the Final GEIS and final rule.

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[12] In some cases, the documents have virtually no bearing on the regulations. For example, those relating to radon release from uranium mines (reports 3, 4, 5 and 16 on petitioners' list).

[13] Petitioners' claim is that they were not permitted to comment on 19 documents, and that the Commission proceedings are therefore deficient on their face. They make no claim about the importance of those documents. Their vague, general statement that "The arbitrariness of the NRC regulations, based on unwarranted technical assumptions and conclusions will be demonstrated in petitioner's arguments on the merits in these proceedings" is not sufficient to show either the importance of the documents or that petitioners would have provided comments on the 19 documents which would have been of significance to the Commission's determinations.

Petitioners have the burden of making a strong showing that they are likely to prevail on the merits of their appeal in order to be entitled to a stay. Virginia Petroleum Jobbers Ass'n, supra at 925. They have made no such showing here. The basic data upon which the challenged regulations were founded was available for comment and petitioners have not shown that they were prevented from making comments which would have been significant to the agency's determinations. Either reason, standing alone, is ground for denying petitioners' motion for a stay.

B. Irreparable Injury

Petitioners contend that they are subject to the prospect of inconsistent regulatory requirements because the NRC issued its Requirements before EPA issued its Standards. They also contend that they will not have an adequate opportunity to participate in proceedings conducted by Agreement States to adopt mill tailings regulations or in proceedings conducted by EPA to adopt Standards. Finally, petitioners claim that they will sustain heavy expenses and unnecessary disruption to their operation if the stay is not granted.

Petitioners concern that they may be subjected to inconsistent regulation is purely speculative, contrary to previous experience, and inconsistent with the coordination between the NRC and EPA. For an allegation of injury to support a motion for a stay, the injury claimed must be certain, immediate, and irreparable, Crowther v. Seaborg, 415 F.2d 437, 439 (10th Cir. 1969), State of New York v. Nuclear Regulatory Commission, 550 F.2d 745 (2d Cir. 1972), Holiday Inns of America, Inc. v. B&B Corp., 409 F.2d 614, 618 (3rd Cir. 1969). None of these criteria are met by the alleged possibility of inconsistent regulations once EPA issues its Standards. Not only is the possibility of inconsistent regulation uncertain, it is also highly unlikely. In the Statement of Consideration accompanying the final rule, the NRC acknowledged that its requirements must be compatible with EPA's Standards and stated that it will continue to coordinate its activities with EPA. 45 Fed. Reg. 65523 (October 3, 1980). The possibility of inconsistency is further reduced by the requirement that EPA must consult with NRC before promulgating any Standards. 42 U.S.C. 2022.c.(1). Previous experience also argues against inconsistency. Although EPA's environmental radiation protection standards applicable to nuclear power plants were issued after NRC issued effluent standards, EPA found that in almost all cases compliance with NRC standards would provide compliance with EPA's standards. 42 Fed.

Reg. 2858 (January 13, 1977). Under these circumstances the possibility of inconsistent regulation must be considered remote. 14/

We have previously disposed of petitioners' argument that it will not have adequate time to comment on the Agreement States implementing regulations, *supra* pp. 22-29, and will not repeat that argument here.

Petitioners argue that the possible expense of compliance with NRC Requirements will result in irreparable injury. However, petitioners present no evidence or estimate of their own compliance costs; they rely instead on an industry estimate of total industry compliance cost, i.e., that compliance with NRC requirements will increase the average cost of uranium concentrate by three percent. 15/ In the absence of specific and compelling evidence of injury to themselves, petitioners have failed to carry their burden of showing irreparable injury. *A.O. Smith Corp*. v. *F.T.C.*, 530 F.2d 515 (3rd Cir. 1976). Additionally, the NRC's extensive cost analysis in the Final GEIS shows that the decommissioning cost for an

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14/ Petitioner has also not provided any basis to support its argument that it will be deprived of a fair hearing at EPA because NRC promulgated Requirements before EPA promulgated its Standards. Congress did not expect EPA to establish Standards in a regulatory vacuum. UMTRCA explicitly provides that EPA will consult with NRC on its Standards. 42 U.S.C. 2022.d. And as we showed *supra*, pp. 17-19, Congress expected the Commission to be the lead regulatory agency, and to have its minimum standards implemented by the Agreement States by November 8, 1981.

15/ Even immediate compliance costs do not constitute irreparable injury absent a showing of such threatened consequences as bankruptcy, *Doran* v. *Salem Inn, Inc*., 422 U.S. 922, 932 (1975), or destruction of business, *Valdez* v. *Applegate*, 616 F.2d 570, 572 (10th Cir. 1980). Petitioners have not made any such showing.

existing mill and tailings pile would be only a small fraction of that estimated in petitioners' Exhibit K. [16] In any event, the vast bulk of the compliance costs are incurred after the mill has ceased to operate, and thus do not constitute an immediate irreparable injury to an operating mill. [17]

Finally, petitioners unsubstantiated argument that worker deaths will result if they cannot use mill tailings as mine backfill does not support a stay. The NRC Requirements would permit the use of tailings as backfill upon a showing that such action will not cause groundwater to be degraded from current or potential uses. 45 Fed. Reg. 65534 (October 3, 1980) (Criterion 5). Moreover, petitioners have not shown that well-known alternative methods of preventing mine cave-ins such as roof bolts, steel plates, steel or wooden pillars and other backfill materials, are unavailable.

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[16] I GEIS at 12-29. These cost figures are supported by Appendixes K-1 through K-9, III GEIS K1-39 (1980). Cost estimates include the costs of excavating, hauling, spreading and compacting the earth used to cover a mill tailings pile and the costs of resurfacing and revegetating the area excavated. III GEIS at K-9 (1980).

[17] Compliance costs for operating mills will stem almost completely from the costs of performing final tailings stabilization and reclamation upon mill decommissioning, and thus do not constitute an immediate irreparable injury.

C. Harm to Other Interested Parties

The State of New Mexico has separately moved for a stay of the effective date of the NRC's Requirements until six months after the completion of this litigation. New Mexico contends that unless a stay is granted it may incur the cost of two hearings on the adoption of mill tailings regulations: one to comply with current NRC Requirements and a second to comply with any changes which might result from this litigation. New Mexico makes no arguments on the merits of the stay motion. Having made no argument on the merits itself warrants denial of their stay request. Moreover, New Mexico's legal argument that a stay should be granted if there is a de minimis chance of success on the merits is flatly contrary to the controlling law in this and all other circuits. Lundgrin v. Claytor, 619 F.2d 61 (10th Cir. 1980). Third, New Mexico has not shown that it will be irreparably harmed by implementing the NRC's UMTRCA requirements. The possible need for a second State hearing is purely speculative and the expense of an administrative proceeding does not constitute irreparable injury. MacBeth v. State of Utah, 332 F. Supp. 1191 (D. Utah, 1971), Meyers v. Bethlehem Shipbuilding Corp., 303 U.S. 41, 51 (1938), Hornblower and Weeks - Hemphill Noyes, Inc. v. Csaky, 427 F. Supp. 814 (S.D.N.Y. 1977).

Finally, New Mexico argues that there will be only a minimum risk to the public health and safety from the grant of a stay since New Mexico's present regulatory scheme is adequate. We deal with the public interest question infra. It seems to us that by setting a firm date for implementation of the Commission's UMTRCA regulations Congress has defined the public interest requirements for this case. Moreover, the situation is not as sanguine as New Mexico paints it to be. NRC has informed New Mexico repeatedly over the last several years that the Commission considers it essential that steps be taken to impose tailings management requirements at existing milling operations. The NRC's January 29, 1981 "report card" to New Mexico identified several current impacts for which there are no State regulations including the control of mill emissions, the blowing of tailings, and seepage of toxic materials into the groundwater. New Mexico has indicated that it can not impose such requirements until NRC's UMTRCA Requirements are in place. Under these circumstances, it is in the public interest to implement the NRC's Requirements on the timetable Congress established. New Mexico has not made a convincing showing that it will be harmed by adhering to that schedule.

D. The Public Interest

The public could be harmed by a stay of the NRC Requirements. Radioactive releases from existing uranium mills constitute the largest source of routine releases from the nuclear fuel cycle. Members of the public who live in the vicinity of uranium mills are exposed to blowing radioactive dust from the tailings piles, and most of the population of the United States is exposed to radioactive radon from uranium mill tailings piles.[18/] More-

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[18/] For example, without the NRC's proposed controls, the lifetime risk to the maximally exposed individual of premature death from cancer due to 15 years of mill operation is over 100 times greater than the average lifetime risk per

(Continued on following page)

over, because the dose calculated in the GEIS is based on a model mill which was chosen to represent an average situation, higher doses can be expected in the vicinity of some mills. Thus, many persons could be unnecessarily exposed to excess levels of radiation if the NRC's Uranium Milling Requirements are stayed.

Each year many millions of tons of tailings are generated at existing mills. As these tailings are generated the potential success of long-term management to control radon release is reduced. Thus, each delay in implementing minimum national standards decreases the probability of fully implementing an adequate disposal program. Congress enacted UMTRCA to prevent or minimize the significant radiation and environmental health hazard from uranium milling and mill tailings. Section 2 of UMTRCA. 19/ Congress determined that the public hazard was serious enough to require the implementation of a national regulatory program by November 8, 1981. This Congressional action clearly demonstrates that it is in the public interest for the Commission and the Agreement States to implement the Commission's Uranium Mill Licensing Requirements on the timetable Congress established.

18/ (Continued from preceding page)

person of cancer mortality from all the radioactivity, except radon, released from the entire uranium fuel cycle in support of all the currently operating and projected nuclear reactors if operated for 30 years.

19/ See also H.R. Rep. No. 95-1480, Part 2, Uranium Mill Tailings Radiation Control Act of 1978, 95th Cong., 2d Sess. 25 (1978).

CONCLUSION

For the foregoing reasons, petitioners' motion for a stay of the Commission's UMTRCA requirements should be denied.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing "Respondents' Opposition to Motion for Stay" were mailed this 15th day of May, 1981, by first class mail, postage prepaid, addressed to the following:

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Public Law 95-604
95th Congress

An Act

To authorize the Secretary of Energy to enter into cooperative agreements with certain States respecting residual radioactive material at existing sites, to provide for the regulation of uranium mill tailings under the Atomic Energy Act of 1954, and for other purposes.

Nov. 8, 1978
[H.R. 13650]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE AND TABLE OF CONTENTS

SECTION 1. This Act may be cited as the "Uranium Mill Tailings Radiation Control Act of 1978".

Uranium Mill Tailings Radiation Control Act of 1978.
42 USC 7901 note.

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Sec. 205. Authorities of Commission respecting certain byproduct material.
Sec. 206. Authority of Environmental Protection Agency respecting certain byproduct material.
Sec. 207. Authorization of appropriations for grants.
Sec. 208. Effective date.
Sec. 209. Consolidation of licenses and procedures.

TITLE III—STUDY AND DESIGNATION OF TWO MILL TAILINGS SITES IN NEW MEXICO

Sec. 301. Study.
Sec. 302. Designation by Secretary.

FINDINGS AND PURPOSES

SEC. 2. (a) The Congress finds that uranium mill tailings located at active and inactive mill operations may pose a potential and significant radiation health hazard to the public, and that the protection of

42 USC 7901.

the public health, safety, and welfare and the regulation of interstate commerce require that every reasonable effort be made to provide for the stabilization, disposal, and control in a safe and environmentally sound manner of such tailings in order to prevent or minimize radon diffusion into the environment and to prevent or minimize other environmental hazards from such tailings.

(b) The purposes of this Act are to provide—

(1) in cooperation with the interested States, Indian tribes, and the persons who own or control inactive mill tailings sites, a program of assessment and remedial action at such sites, including, where appropriate, the reprocessing of tailings to extract residual uranium and other mineral values where practicable, in order to stabilize and control such tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public, and

(2) a program to regulate mill tailings during uranium or thorium ore processing at active mill operations and after termination of such operations in order to stabilize and control such tailings in a safe and environmentally sound manner and to minimize or eliminate radiation health hazards to the public.

TITLE I—REMEDIAL ACTION PROGRAM

DEFINITIONS

42 USC 7911.

SEC. 101. For purposes of this title—

(1) The term "Secretary" means the Secretary of Energy.

(2) The term "Commission" means the Nuclear Regulatory Commission.

(3) The term "Administrator" means the Administrator of the Environmental Protection Agency.

(4) The term "Indian tribe" means any tribe, band, clan, group, pueblo, or community of Indians recognized as eligible for services provided by the Secretary of the Interior to Indians.

(5) The term "person" means any individual, association, partnership, corporation, firm, joint venture, trust, government entity, and any other entity, except that such term does not include any Indian or Indian tribe.

(6) The term "processing site" means—

(A) any site, including the mill, containing residual radioactive materials at which all or substantially all of the uranium was produced for sale to any Federal agency prior to January 1, 1971 under a contract with any Federal agency, except in the case of a site at or near Slick Rock, Colorado, unless—

(i) such site was owned or controlled as of January 1, 1978, or is thereafter owned or controlled, by any Federal agency, or

42 USC 2011 note.
42 USC 2021.

(ii) a license (issued by the Commission or its predecessor agency under the Atomic Energy Act of 1954 or by a State as permitted under section 274 of such Act) for the production at such site of any uranium or thorium product derived from ores is in effect on January 1, 1978, or is issued or renewed after such date; and

(B) any other real property or improvement thereon which—

(i) is in the vicinity of such site, and

(ii) is determined by the Secretary, in consultation with the Commission, to be contaminated with residual radioactive materials derived from such site.

Any ownership or control of an area by a Federal agency which is acquired pursuant to a cooperative agreement under this title shall not be treated as ownership or control by such agency for purposes of subparagraph (A)(i). A license for the production of any uranium product from residual radioactive materials shall not be treated as a license for production from ores within the meaning of subparagraph (A)(ii) if such production is in accordance with section 108(b).

(7) The term "residual radioactive material" means—

(A) waste (which the Secretary determines to be radioactive) in the form of tailings resulting from the processing of ores for the extraction of uranium and other valuable constituents of the ores; and

(B) other waste (which the Secretary determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials.

(8) The term "tailings" means the remaining portion of a metal-bearing ore after some or all of such metal, such as uranium, has been extracted.

(9) The term "Federal agency" includes any executive agency as defined in section 105 of title 5 of the United States Code.

(10) The term "United States" means the 48 contiguous States and Alaska, Hawaii, Puerto Rico, the District of Columbia, and the territories and possessions of the United States.

DESIGNATION OF PROCESSING SITES

SEC. 102. (a)(1) As soon as practicable, but no later than one year after enactment of this Act, the Secretary shall designate processing sites at or near the following locations:

42 USC 7912.

Salt Lake City, Utah
Green River, Utah
Mexican Hat, Utah
Durango, Colorado
Grand Junction, Colorado
Rifle, Colorado (two sites)
Gunnison, Colorado
Naturita, Colorado
Maybell, Colorado
Slick Rock, Colorado (two sites)
Shiprock, New Mexico
Ambrosia Lake, New Mexico
Riverton, Wyoming
Converse County, Wyoming
Lakeview, Oregon
Falls City, Texas
Tuba City, Arizona
Monument Valley, Arizona
Lowman, Idaho
Cannonsburg, Pennsylvania

Remedial action.

Subject to the provisions of this title, the Secretary shall complete remedial action at the above listed sites before his authority terminates under this title. The Secretary shall within one year of the date of enactment of this Act also designate all other processing sites within the United States which he determines requires remedial action to carry out the purposes of this title. In making such designation, the Secretary shall consult with the Administrator, the Commission, and the affected States, and in the case of Indian lands, the appropriate Indian tribe and the Secretary of the Interior.

(2) As part of his designation under this subsection, the Secretary, in consultation with the Commission, shall determine the boundaries of each such site.

86 Stat. 222.

(3) No site or structure with respect to which remedial action is authorized under Public Law 92-314 in Grand Junction, Colorado, may be designated by the Secretary as a processing site under this section.

Health hazard assessment.

(b) Within one year from the date of the enactment of this Act, the Secretary shall assess the potential health hazard to the public from the residual radioactive materials at designated processing sites. Based upon such assessment, the Secretary shall, within such one year period, establish priorities for carrying out remedial action at each such site. In establishing such priorities, the Secretary shall rely primarily on the advice of the Administrator.

Notification.

(c) Within thirty days after making designations of processing sites and establishing the priorities for such sites under this section, the Secretary shall notify the Governor of each affected State, and, where appropriate, the Indian tribes and the Secretary of the Interior.

(d) The designations made, and priorities established, by the Secretary under this section shall be final and not be subject to judicial review.

(e)(1) The designation of processing sites within one year after enactment under this section shall include, to the maximum extent practicable, the areas referred to in section 101(6)(B).

(2) Notwithstanding the one year limitation contained in this section, the Secretary may, after such one year period, include any area described in section 101(6)(B) as part of a processing site designated under this section if he determines such inclusion to be appropriate to carry out the purposes of this title.

STATE COOPERATIVE AGREEMENTS

42 USC 7913.

Sec. 103. (a) After notifying a State of the designation referred to in section 102 of this title, the Secretary subject to section 113, is authorized to enter into cooperative agreements with such State to perform remedial actions at each designated processing site in such State (other than a site located on Indian lands referred to in section 105). The Secretary shall, to the greatest extent practicable, enter into such agreements and carry out such remedial actions in accordance with the priorities established by him under section 102. The Secretary shall commence preparations for cooperative agreements with respect to each designated processing site as promptly as practicable following the designation of each site.

Terms and Conditions.

(b) Each cooperative agreement under this section shall contain such terms and conditions as the Secretary deems appropriate and consistent with the purposes of this Act, including, but not limited to, a limitation on the use of Federal assistance to those costs which are directly required to complete the remedial action selected pursuant to section 108.

Written consent.

(c)(1) Except where the State is required to acquire the processing site as provided in subsection (a) of section 104, each cooperative agreement with a State under section 103 shall provide that the State shall obtain, in a form prescribed by the Secretary, written consent from any person holding any record interest in the designated processing site for the Secretary or any person designated by him to perform remedial action at such site.

Waiver.

(2) Such written consent shall include a waiver by each such person on behalf of himself, his heirs, successors, and assigns—

(A) releasing the United States of any liability or claim thereof by such person, his heirs, successors, and assigns concerning such remedial action, and

(B) holding the United States harmless against any claim by such person on behalf of himself, his heirs, successors, or assigns arising out of the performance of any such remedial action.

(d) Each cooperative agreement under this section shall require the State to assure that the Secretary, the Commission, and the Administrator and their authorized representatives have a permanent right of entry at any time to inspect the processing site and the site provided pursuant to section 104(b)(1) in furtherance of the provisions of this title and to carry out such agreement and enforce this Act and any rules prescribed under this Act. Such right of entry under this section or section 106 into an area described in section 101(6)(B) shall terminate on completion of the remedial action, as determined by the Secretary.

(e) Each agreement under this section shall take effect only upon the concurrence of the Commission with the terms and conditions thereof.

(f) The Secretary may, in any cooperative agreement entered into under this section or section 105, provide for reimbursement of the actual costs, as determined by the Secretary, of any remedial action performed with respect to so much of a designated processing site as is described in section 101(6)(B). Such reimbursement shall be made only to a property owner of record at the time such remedial action was undertaken and only with respect to costs incurred by such property owner. No such reimbursement may be made unless—

(1) such remedial action was completed prior to enactment of this Act, and unless the application for such reimbursement was filed by such owner within one year after an agreement under this section or section 105 is approved by the Secretary and the Commission, and

(2) the Secretary is satisfied that such action adequately achieves the purposes of this Act with respect to the site concerned and is consistent with the standards established by the Administrator pursuant to section 275(a) of the Atomic Energy Act of 1954.

Post, p. 3039.

ACQUISITION AND DISPOSITION OF LANDS AND MATERIALS

42 USC 7914.

SEC. 104. (a) Each cooperative agreement under section 103 shall require the State, where determined appropriate by the Secretary with the concurrence of the Commission, to acquire any designated processing site, including where appropriate any interest therein. In determining whether to require the State to acquire a designated processing site or interest therein, consideration shall be given to the prevention of windfall profits.

Residual radioactive material, removal.

(b)(1) If the Secretary with the concurrence of the Commission determines that removal of residual radioactive material from a processing site is appropriate, the cooperative agreement shall provide that the State shall acquire land (including, where appropriate, any interest therein) to be used as a site for the permanent disposition and stabilization of such residual radioactive materials in a safe and environmentally sound manner.

(2) Acquisition by the State shall not be required under this subsection if a site located on land controlled by the Secretary or made available by the Secretary of the Interior pursuant to section 106(a)(2) is designated by the Secretary, with the concurrence of the Commission. for such disposition and stabilization.

(c) No State shall be required under subsection (a) or (b) to acquire any real property or improvement outside the boundaries of—

(1) that portion of the processing site which is described in section 101(6)(A), and

(2) the site used for disposition of the residual radioactive materials.

Notification.

Rules and regulations.

(d) In the case of each processing site designated under this title other than a site designated on Indian land, the State shall take such action as may be necessary, and pursuant to regulations of the Secretary under this subsection, to assure that any person who purchases such a processing site after the removal of radioactive materials from such site shall be notified in an appropriate manner prior to such purchase, of the nature and extent of residual radioactive materials removed from the site, including notice of the date when such action took place, and the condition of such site after such action. If the State is the owner of such site, the State shall so notify any prospective purchaser before entering into a contract, option, or other arrangement to sell or otherwise dispose of such site. The Secretary shall issue appropriate rules and regulations to require notice in the local land records of the residual radioactive materials which were located at any processing site and notice of the nature and extent of residual radioactive materials removed from the site, including notice of the date when such action took place.

(e)(1) The terms and conditions of any cooperative agreement with a State under section 103 shall provide that in the case of any lands or interests therein acquired by the State pursuant to subsection (a), the State, with the concurrence of the Secretary and the Commission, may—

(A) sell such lands and interests,

(B) permanently retain such land and interests in lands (or donate such lands and interests therein to another governmental entity within such State) for permanent use by such State or entity solely for park, recreational, or other public purposes, or

(C) transfer such lands and interests to the United States as provided in subsection (f).

No lands may be sold under subparagraph (A) without the consent of the Secretary and the Commission. No site may be sold under subparagraph (A) or retained under subparagraph (B) if such site is used for the disposition of residual radioactive materials.

(2) Before offering for sale any lands and interests therein which comprise a processing site, the State shall offer to sell such lands and interests at their fair market value to the person from whom the State acquired them.

(f)(1) Each agreement under section 103 shall provide that title to—

(A) the residual radioactive materials subject to the agreement, and

(B) any lands and interests therein which have been acquired by the State, under subsection (a) or (b), for the disposition of such materials,

shall be transferred by the State to the Secretary when the Secretary (with the concurrence of the Commission) determines that remedial action is completed in accordance with the requirements imposed pursuant to this title. No payment shall be made in connection with the transfer of such property from funds appropriated for purposes of this Act other than payments for any administrative and legal costs incurred in carrying out such transfer.

(2) Custody of any property transferred to the United States under this subsection shall be assumed by the Secretary or such Federal agency as the President may designate. Notwithstanding any other provision of law, upon completion of the remedial action program authorized by this title, such property and minerals shall be maintained pursuant to a license issued by the Commission in such manner as will protect the public health, safety, and the environment. The Commission may, pursuant to such license or by rule or order, require the Secretary or other Federal agency having custody of such property and minerals to undertake such monitoring, maintenance, and emergency measures necessary to protect public health and safety and other actions as the Commission deems necessary to comply with the standards of section 275(a) of the Atomic Energy Act of 1954. The Secretary or such other Federal agency is authorized to carry out maintenance, monitoring and emergency measures under this subsection, but shall take no other action pursuant to such license, rule or order with respect to such property and minerals unless expressly authorized by Congress after the date of enactment of this Act. The United States shall not transfer title to property or interest therein acquired under this subsection to any person or State, except as provided in subsection (h).

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(g) Each agreement under section 103 which permits any sale described in subsection (e)(1)(A) shall provide for the prompt reimbursement to the Secretary from the proceeds of such sale. Such reimbursement shall be in an amount equal to the lesser of—

(1) that portion of the fair market value of the lands or interests therein which bears the same ratio to such fair market value as the Federal share of the costs of acquisition by the State to such lands or interest therein bears to the total cost of such acquisition, or

(2) the total amount paid by the Secretary with respect to such acquisition.

The fair market value of such lands or interest shall be determined by the Secretary as of the date of the sale by the State. Any amounts received by the Secretary under this title shall be deposited in the Treasury of the United States as miscellaneous receipts.

Fair market value.

(h) No provision of any agreement under section 103 shall prohibit the Secretary of the Interior, with the concurrence of the Secretary of Energy and the Commission, from disposing of any subsurface mineral rights by sale or lease (in accordance with laws of the United States applicable to the sale, lease, or other disposal of such rights) which are associated with land on which residual radioactive materials are disposed and which are transferred to the United States as required under this section if the Secretary of the Interior takes such action as the Commission deems necessary pursuant to a license issued by the Commission to assure that the residual radioactive materials will not be disturbed by reason of any activity carried on following such disposition. If any such materials are disturbed by any such activity, the Secretary of the Interior shall insure, prior to the disposition of the minerals, that such materials will be restored to a safe and environmentally sound condition as determined by the Commission, and that the costs of such restoration will be borne by the person acquiring such rights from the Secretary of the Interior or from his successor or assign.

INDIAN TRIBE COOPERATIVE AGREEMENTS

42 USC 7915.

SEC. 105. (a) After notifying the Indian tribe of the designation pursuant to section 102 of this title, the Secretary, in consultation with the Secretary of the Interior, is authorized to enter into a cooperative agreement, subject to section 113, with any Indian tribe to perform remedial action at a designated processing site located on land of such Indian tribe. The Secretary shall, to the greatest extent practicable, enter into such agreements and carry out such remedial actions in accordance with the priorities established by him under section 102. In performing any remedial action under this section and in carrying out any continued monitoring or maintenance respecting residual radioactive materials associated with any site subject to a cooperative agreement under this section, the Secretary shall make full use of any qualified members of Indian tribes resident in the vicinity of any such site. Each such agreement shall contain such terms and conditions as the Secretary deems appropriate and consistent with the purposes of this Act. Such terms and conditions shall require the following:

Terms and conditions.

(1) The Indian tribe and any person holding any interest in such land shall execute a waiver (A) releasing the United States of any liability or claim thereof by such tribe or person concerning such remedial action and (B) holding the United States harmless against any claim arising out of the performance of any such remedial action.

(2) The remedial action shall be selected and performed in accordance with section 108 by the Secretary or such person as he may designate.

(3) The Secretary, the Commission, and the Administrator and their authorized representatives shall have a permanent right of entry at any time to inspect such processing site in furtherance of the provisions of this title, to carry out such agreement, and to enforce any rules prescribed under this Act.

Each agreement under this section shall take effect only upon concurrence of the Commission with the terms and conditions thereof.

(b) When the Secretary with the concurrence of the Commission determines removal of residual radioactive materials from a processing site on lands described in subsection (a) to be appropriate, he shall provide, consistent with other applicable provisions of law, a site or sites for the permanent disposition and stabilization in a safe and environmentally sound manner of such residual radioactive materials. Such materials shall be transferred to the Secretary (without payment therefor by the Secretary) and permanently retained and maintained by the Secretary under the conditions established in a license issued by the Commission, subject to section 104(f)(2) and (h).

Transfer to Secretary of the Interior.

ACQUISITION OF LAND BY SECRETARY

42 USC 7916.

SEC. 106. Where necessary or appropriate in order to consolidate in a safe and environmentally sound manner the location of residual radioactive materials which are removed from processing sites under cooperative agreements under this title, or where otherwise necessary for the permanent disposition and stabilization of such materials in such manner—

(1) the Secretary may acquire land and interests in land for such purposes by purchase, donation, or under any other authority of law or

(2) the Secretary of the Interior may make available public lands administered by him for such purposes in accordance with other applicable provisions of law.

Consultation.

Prior to acquisition of land under paragraph (1) or (2) of this subsection in any State, the Secretary shall consult with the Governor of such State. No lands may be acquired under such paragraph (1) or (2) in any State in which there is no (1) processing site designated under this title or (2) active uranium mill operation, unless the Secretary has obtained the consent of the Governor of such State. No lands controlled by any Federal agency may be transferred to the Secretary to carry out the purposes of this Act without the concurrence of the chief administrative officer of such agency.

FINANCIAL ASSISTANCE

42 USC 7917.

SEC. 107. (a) In the case of any designated processing site for which an agreement is executed with any State for remedial action at such site, the Secretary shall pay 90 per centum of the actual cost of such remedial action, including the actual costs of acquiring such site (and any interest therein) or any disposition site (and any interest therein) pursuant to section 103 of this title, and the State shall pay the remainder of such costs from non-Federal funds. The Secretary shall not pay the administrative costs incurred by any State to develop, prepare, and carry out any cooperative agreement executed with such State under this title, except the proportionate share of the administrative costs associated with the acquisition of lands and interests therein acquired by the State pursuant to this title.

(b) In the case of any designated processing site located on Indian lands, the Secretary shall pay the entire cost of such remedial action.

REMEDIAL ACTION

42 USC 7918.

SEC. 108. (a)(1) The Secretary or such person as he may designate shall select and perform remedial actions at designated processing sites and disposal sites in accordance with the general standards prescribed

Post, p. 3039.

by the Administrator pursuant to section 275 a. of the Atomic Energy Act of 1954. The State shall participate fully in the selection and performance of a remedial action for which it pays part of the cost. Such remedial action shall be selected and performed with the concurrence of the Commission and in consultation, as appropriate, with the Indian tribe and the Secretary of the Interior.

(2) The Secretary shall use technology in performing such remedial action as will insure compliance with the general standards promulgated by the Administrator under section 275 a. of the Atomic Energy Act of 1954 and will assure the safe and environmentally sound stabilization of residual radioactive materials, consistent with existing law. No such remedial action may be undertaken under this section before the promulgation by the Administrator of such standards.

Evaluation.

(b) Prior to undertaking any remedial action at a designated site pursuant to this title, the Secretary shall request expressions of interest from private parties regarding the remilling of the residual radioactive materials at the site and, upon receipt of any expression of interest, the Secretary shall evaluate among other things the mineral concentration of the residual radioactive materials at each designated processing site to determine whether, as a part of any remedial action program, recovery of such minerals is practicable. The Secretary, with the concurrence of the Commission, may permit the recovery of such minerals, under such terms and conditions as he may prescribe to carry out the purposes of this title. No such recovery shall be permitted unless such recovery is consistent with remedial action. Any person permitted by the Secretary to recover such mineral shall pay to the Secretary a share of the net profits derived from such recovery, as determined by the Secretary. Such share shall not exceed the total amount paid by the Secretary for carrying out remedial action at such designated site. After payment of such share to the United States under this subsection, such person shall pay to the State in which the residual radioactive materials are located a share of the net profits derived from such recovery, as determined by the Secretary. The person recovering such minerals shall bear all costs of such recovery. Any person carrying out mineral recovery activities under this paragraph shall be required to obtain any necessary license under the Atomic Energy Act of 1954 or under State law as permitted under section 274 of such Act.

42 USC 2021.

RULES

42 USC 7919.

Sec. 109. The Secretary may prescribe such rules consistent with the purposes of this Act as he deems appropriate pursuant to title V of the Department of Energy Organization Act.

ENFORCEMENT

42 USC 7920.

Sec. 110. (a)(1) Any person who violates any provision of this title or any cooperative agreement entered into pursuant to this title or any rule prescribed under this Act concerning any designated processing site, disposition site, or remedial action shall be subject to an assessment by the Secretary of a civil penalty of not more than $1,000 per day per violation. Such assessment shall be made by order after notice and an opportunity for a public hearing, pursuant to section 554 of title 5, United States Code.

Notice, hearing opportunity.

(2) Any person against whom a penalty is assessed under this section may, within sixty calendar days after the date of the order of

the Secretary assessing such penalty, institute an action in the United States court of appeals for the appropriate judicial circuit for judicial review of such order in accordance with chapter 7 of title 5, United States Code. The court shall have jurisdiction to enter a judgment affirming, modifying, or setting aside in whole or in part, the order of the Secretary, or the court may remand the proceeding to the Secretary for such further action as the court may direct. 5 USC 500 *et seq.* Jurisdiction.

(3) If any person fails to pay an assessment of a civil penalty after it has become a final and unappealable order, the Secretary shall institute an action to recover the amount of such penalty in any appropriate district court of the United States. In such action, the validity and appropriateness of such final assessment order or judgment shall not be subject to review. Section 402(d) of the Department of Energy Organization Act shall not apply with respect to the functions of the Secretary under this section. 42 USC 7172.

(4) No civil penalty may be assessed against the United States or any State or political subdivision of a State or any official or employee of the foregoing.

(5) Nothing in this section shall prevent the Secretary from enforcing any provision of this title or any cooperative agreement or any such rule by injunction or other equitable remedy.

(b) Subsection (a) shall not apply to any licensing requirement under the Atomic Energy Act of 1954. Such licensing requirements shall be enforced by the Commission as provided in such Act. 42 USC 2011 note.

PUBLIC PARTICIPATION

Sec. 111. In carrying out the provisions of this title, including the designation of processing sites, establishing priorities for such sites, the selection of remedial actions, and the execution of cooperative agreements, the Secretary, the Administrator, and the Commission shall encourage public participation and, where appropriate, the Secretary shall hold public hearings relative to such matters in the States where processing sites and disposal sites are located. 42 USC 7921.

TERMINATION; AUTHORIZATION

Sec. 112. (a) The authority of the Secretary to perform remedial action under this title shall terminate on the date seven years after the date of promulgation by the Administrator of general standards applicable to such remedial action unless such termination date is specifically extended by an Act of Congress enacted after the date of enactment of this Act. 42 USC 7922.

(b) The amounts authorized to be appropriated to carry out the purposes of this title by the Secretary, the Administrator, the Commission, and the Secretary of the Interior shall not exceed such amounts as are established in annual authorization Acts for fiscal year 1979 and each fiscal year thereafter applicable to the Department of Energy. Any sums appropriated for the purposes of this title shall be available until expended.

LIMITATION

Sec. 113. The authority under this title to enter into contracts or other obligations requiring the United States to make outlays may 42 USC 7923.

be exercised only to the extent provided in advance in annual authorization and appropriation Acts.

REPORTS TO CONGRESS

42 USC 7924.

SEC. 114. (a) Beginning on January 1, 1980, and each year thereafter until January 1, 1986, the Secretary shall submit a report to the Congress with respect to the status of the actions required to be taken by the Secretary, the Commission, the Secretary of the Interior, the Administrator, and the States and Indian tribes under this Act and any amendments to other laws made by this Act. Each report shall—

(1) include data on the actual and estimated costs of the program authorized by this title;

(2) describe the extent of participation by the States and Indian tribes in this program;

(3) evaluate the effectiveness of remedial actions, and describe any problems associated with the performance of such actions; and

(4) contain such other information as may be appropriate.

Such report shall be prepared in consultation with the Commission, the Secretary of the Interior, and the Administrator and shall contain their separate views, comments, and recommendations, if any. The Commission shall submit to the Secretary and Congress such portion of the report under this subsection as relates to the authorities of the Commission under title II of this Act.

(b) Not later than July 1, 1979, the Secretary shall provide a report to the Congress which identifies all sites located on public or acquired lands of the United States containing residual radioactive materials and other raidoactive waste (other than waste resulting from the production of electric energy) and specifies which Federal agency has jurisdiction over such sites. The report shall include the identity of property and other structures in the vicinity of such site that are contaminated or may be contaminated by such materials and the actions planned or taken to remove such materials. The report shall describe in what manner such sites are adequately stabilized and otherwise controlled to prevent radon diffusion from such sites into the environment and other environmental harm. If any site is not so stabilized or controlled, the report shall describe the remedial actions planned for such site and the time frame for performing such actions. In preparing the reports under this section, the Secretary shall avoid duplication of previous or ongoing studies and shall utilize all information available from other departments and agencies of the United States respecting the subject matter of such report. Such agencies shall cooperate with the Secretary in the preparation of such report and furnish such information as available to them and necessary for such report.

Cooperation.

(c) Not later than January 1, 1980, the Administrator, in consultation with the Commission, shall provide a report to the Congress which identifies the location and potential health, safety, and environmental hazards of uranium mine wastes together with recommendations, if any, for a program to eliminate these hazards.

(d) Copies of the reports required by this section to be submitted to the Congress shall be separately submitted to the Committees on Interior and Insular Affairs and on Interstate and Foreign Commerce of the House of Representatives and the Committee on Energy and Natural Resources of the Senate.

(e) The Commission, in cooperation with the Secretary, shall ensure that any relevant information, other than trade secrets and other proprietary information otherwise exempted from mandatory disclosure under any other provision of law, obtained from the conduct of each of the remedial actions authorized by this title and the subsequent perpetual care of those residual radioactive materials is documented systematically, and made publicly available conveniently for use.

ACTIVE OPERATIONS; LIABILITY FOR REMEDIAL ACTION

SEC. 115. (a) No amount may be expended under this title with respect to any site licensed by the Commission under the Atomic Energy Act of 1954 or by a State as permitted under section 274 of such Act at which production of any uranium product from ores (other than from residual radioactive materials) takes place.

42 USC 7925.
42 USC 2011 note.
42 USC 2021.

(b) In the case of each processing site designated under this title, the Attorney General shall conduct a study to determine the identity and legal responsibility which any person (other than the United States, a State, or Indian tribe) who owned or operated or controlled (as determined by the Attorney General) such site before the date of the enactment of this Act may have under any law or rule of law for reclamation or other remedial action with respect to such site. The Attorney General shall publish the results of such study, and provide copies thereof to the Congress, as promptly as practicable following the date of the enactment of this Act. The Attorney General, based on such study, shall, to the extent he deems it appropriate and in the public interest, take such action under any provision of law in effect when uranium was produced at such site to require payment by such person of all or any part of the costs incurred by the United States for such remedial action for which he determines such person is liable.

Study.

TITLE II—URANIUM MILL TAILINGS LICENSING AND REGULATION DEFINITION

SEC. 201. Section 11e. of the Atomic Energy Act of 1954, is amended to read as follows:

42 USC 2014.

"e. The term 'byproduct material' means (1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and (2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

"Byproduct material."

CUSTODY OF DISPOSAL SITE

SEC. 202. (a) Chapter 8 of the Atomic Energy Act of 1954, is amended by adding the following new section at the end thereof:

42 USC 2111 et seq.

"SEC. 83. OWNERSHIP AND CUSTODY OF CERTAIN BYPRODUCT MATERIAL AND DISPOSAL SITES.—

42 USC 2113.

"a. Any license issued or renewed after the effective date of this section under section 62 or section 81 for any activity which results in the production of any byproduct material, as defined in section 11e.

42 USC 2002, 2111.
42 USC 2014.

(2), shall contain such terms and conditions as the Commission determines to be necessary to assure that, prior to termination of such license—

"(1) the licensee will comply with decontamination, decommissioning, and reclamation standards prescribed by the Commission for sites (A) at which ores were processed primarily for their source material content and (B) at which such byproduct material is deposited, and

42 USC 2014.

"(2) ownership of any byproduct material, as defined in section 11 e. (2), which resulted from such licensed activity shall be transferred to (A) the United States or (B) in the State in which such activity occurred if such State exercises the option under subsection b. [illegible] acquire land used for the disposal of byproduct material.

Any license in effect on the date of the enactment of this section shall either contain such terms and conditions on renewal thereof after the effective date of this section, or comply with paragraphs (1) and (2) upon the termination of such license, whichever first occurs.

Rule, regulation or order.

"(b)(1)(A) The Commission shall require by rule, regulation, or order that prior to the termination of any license which is issued after the effective date of this section, title to the land, including any interests therein (other than land owned by the United States or by a State) which is used for the disposal of any byproduct material, as defined by section 11 e. (2), pursuant to such license shall be transferred to—

"(A) the United States, or

"(B) the State in which such land is located, at the option of such State.

"(2) Unless the Commission determines prior to such termination that transfer of title to such land and such byproduct material is not necessary or desirable to protect the public health, safety, or welfare or to minimize or eliminate danger to life or property. Such determination shall be made in accordance with section 181 of this Act. Notwithstanding any other provision of law or any such determination, such property and materials shall be maintained pursuant to a license issued by the Commission pursuant to section 84(b) in such manner as will protect the public health, safety, and the environment.

"(B) If the Commission determines by order that use of the surface or subsurface estates, or both, of the land transferred to the United States or to a State under subparagraph (A) would not endanger the public health, safety, welfare, or environment, the Commission, pursuant to such regulations as it may prescribe, shall permit the use of the surface or subsurface estates, or both, of such land in a manner consistent with the provisions of this section. If the Commission permits such use of such land, it shall provide the person who transferred such land with the right of first refusal with respect to such use of such land.

"(2) If transfer to the United States of title to such byproduct material and such land is required under this section, the Secretary of Energy or any Federal agency designated by the President shall, following the Commission's determination of compliance under subsection c., assume title and custody of such byproduct material and land transferred as provided in this subsection. Such Secretary or Federal agency shall maintain such material and land in such manner as will protect the public health and safety and the environment. Such custody may be transferred to another officer or instrumentality of the United States only upon approval of the President.

"(3) If transfer to a State of title to such byproduct material is required in accordance with this subsection, such State shall, following the Commission's determination of compliance under subsection d., assume title and custody of such byproduct material and land transferred as provided in this subsection. Such State shall maintain such material and land in such manner as will protect the public health, safety, and the environment.

"(4) In the case of any such license under section 62, which was in effect on the effective date of this section, the Commission may require, before the termination of such license, such transfer of land and interests therein (as described in paragraph (1) of this subsection) to the United States or a State in which such land is located, at the option of such State, as may be necessary to protect the public health, welfare, and the environment from any effects associated with such byproduct material. In exercising the authority of this paragraph, the Commission shall take into consideration the status of the ownership of such land and interests therein and the ability of the licensee to transfer title and custody thereof to the United States or a State.

42 USC 2092.

"(5) The Commission may, pursuant to a license, or by rule or order, require the Secretary or other Federal agency or State having custody of such property and materials to undertake such monitoring, maintenance, and emergency measures as are necessary to protect the public health and safety and such other actions as the Commission deems necessary to comply with the standards promulgated pursuant to section 84 of this Act. The Secretary or such other Federal agency is authorized to carry out maintenance, monitoring, and emergency measures, but shall take no other action pursuant to such license, rule or order, with respect to such property and materials unless expressly authorized by Congress after the date of enactment of this Act.

Post, p. 3039.

"(6) The transfer of title to land or byproduct materials, as defined in section 11 e. (2), to a State or the United States pursuant to this subsection shall not relieve any licensee of liability for any fraudulent or negligent acts done prior to such transfer.

42 USC 2014.

"(7) Material and land transferred to the United States or a State in accordance with this subsection shall be transferred without cost to the United States or a State (other than administrative and legal costs incurred in carrying out such transfer). Subject to the provisions of paragraph (1)(B) of this subsection, the United States or a State shall not transfer title to material or property acquired under this subsection to any person, unless such transfer is in the same manner as provided under section 104(h) of the Uranium Mill Tailings Radiation Control Act of 1978.

"(8) The provisions of this subsection respecting transfer of title and custody to land shall not apply in the case of lands held in trust by the United States for any Indian tribe or lands owned by such Indian tribe subject to a restriction against alienation imposed by the United States. In the case of such lands which are used for the disposal of byproduct material, as defined in section 11 e. (2), the licensee shall be required to enter into such arrangements with the Commission as may be appropriate to assure the long-term maintenance and monitoring of such lands by the United States.

"c. Upon termination on any license to which this section applies, the Commission shall determine whether or not the licensee has complied with all applicable standards and requirements under such license.".

Effective date. 42 USC 2113 note. (b) This section shall be effective three years after the enactment of this Act.

(c) The table of contents for chapter 8 of the Atomic Energy Act of 1954, is amended by inserting the following new item after the item relating to section 82:

"Sec. 83. Ownership and custody of certain byproduct material and disposal sites.".

AUTHORITY TO ESTABLISH CERTAIN REQUIREMENTS

42 USC 2201. SEC. 203. Section 161 of the Atomic Energy Act of 1954, is amended by adding the following new subsection at the end thereof:

"x. Establish by rule, regulation, or order, after public notice, and 42 USC 2231. in accordance with the requirements of section 181 of this Act, such standards and instructions as the Commission may deem necessary or desirable to ensure—

"(1) that an adequate bond, surety, or other financial arrangement (as determined by the Commission) will be provided, before termination of any license for byproduct material as 42 USC 2014. defined in section 11 e. (2), by a licensee to permit the completion of all requirements established by the Commission for the decontamination, decommissioning, and reclamation of sites, structures, and equipment used in conjunction with byproduct material as so defined, and

"(2) that—

"(A) in the case of any such license issued or renewed after the date of the enactment of this subsection, the need for long term maintenance and monitoring of such sites, structures and equipment after termination of such license will be minimized and, to the maximum extent practicable, eliminated; and

"(B) in the case of each license for such material (whether in effect on the date of the enactment of this section or issued or renewed thereafter), if the Commission determines that any such long-term maintenance and monitoring is necessary, the licensee, before termination of any license for byproduct material as defined in section 11 e. (2), will make available such bonding, surety, or other financial arrangements as may be necessary to assure such long-term maintenance and monitoring.

Such standards and instructions promulgated by the Commission pursuant to this subsection shall take into account, as determined by the Commission, so as to avoid unnecessary duplication and expense, performance bonds or other financial arrangements which are required by other Federal agencies or State agencies and/or other local governing bodies for such decommissioning, decontamination, and reclamation and long-term maintenance and monitoring except that nothing in this paragraph shall be construed to require that the Commission accept such bonds or arrangements if the Commission determines that such bonds or arrangements are not adequate to carry out subparagraphs (1) and (2) of this subsection.".

COOPERATION WITH STATES

42 USC 2021. SEC. 204. (a) Section 274 b. of the Atomic Energy Act of 1954, is amended by adding "as defined in section 11 e. (1)" after the words

"byproduct materials" in paragraph (1) by renumbering paragraphs (2) and (3) as paragraphs (3) and (4); and by inserting the following new paragraph immediately after paragraph (1):

"(2) byproduct materials as defined in section 11 e. (2);".

(b) Section 274 d. (2) of such Act is amended by inserting the following before the word "compatible": "in accordance with the requirements of subsection o. and in all other respects". 42 USC 2021.

(c) Section 274 n. of such Act is amended by adding the following new sentence at the end thereof: "As used in this section, the term 'agreement' includes any amendment to any agreement.". "Agreement."

(d) Section 274 j. of such Act is amended—

(1) by inserting "all or part of" after "suspend";

(2) by inserting "(1)" after "finds that": and

(3) by adding at the end before the period the following: ", or (2) the State has not complied with one or more of the requirements of this section. The Commission shall periodically review such agreements and actions taken by the States under the agreements to ensure compliance with the provisions of this section.". Review.

(e) (1) Section 274 of such Act is amended by adding the following new subsection at the end thereof:

"o. In the licensing and regulation of byproduct material, as defined in section 11 e. (2) of this Act, or of any activity which results in the production of byproduct material as so defined under an agreement entered into pursuant to subsection b., a State shall require—

"(1) compliance with the requirements of subsection b. of section 83 (respecting ownership of byproduct material and land), and

"(2) compliance with standards which shall be adopted by the State for the protection of the public health, safety, and the environment from hazards associated with such material which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission for the same purpose, including requirements and standards promulgated by the Commission and the Administrator of the Environmental Protection Agency pursuant to sections 83, 84, and 275, and *Ante*, p. 3033. *Post*, p. 3039.

"(3) procedures which—

"(A) in the case of licenses, provide procedures under State law which include—

"(i) an opportunity, after public notice, for written comments and a public hearing, with a transcript,

"(ii) an opportunity for cross examination, and

"(iii) a written determination which is based upon findings included in such determination and upon the evidence presented during the public comment period and which is subject to judicial review;

"(B) in the case of rulemaking, provide an opportunity for public participation through written comments or a public hearing and provide for judicial review of the rule;

"(C) require for each license which has a significant impact on the human environment a written analysis (which shall be available to the public before the commencement of any such proceedings) of the impact of such license, including any activities conducted pursuant thereto, on the environment, which analysis shall include—

"(i) an assessment of the radiological and nonradiological impacts to the public health of the activities to be conducted pursuant to such license;

"(ii) an assessment of any impact on any waterway and groundwater resulting from such activities;

"(iii) consideration of alternatives, including alternative sites and engineering methods, to the activities to be conducted pursuant to such license; and

"(iv) consideration of the long-term impacts, including decommissioning, decontamination, and reclamation impacts, associated with activities to be conducted pursuant to such license, including the management of any byproduct material, as defined by section 11 e. (2); and

"(D) prohibit any major construction activity with respect to such material prior to complying with the provisions of subparagraph (C).

If any State under such agreement imposes upon any licensee any requirement for the payment of funds to such State for the reclamation or long-term maintenance and monitoring of such material, and if transfer to the United States of such material is required in accord-
Ante, p. 3033. ance with section 83 b. of this Act, such agreement shall be amended by the Commission to provide that such State shall transfer to the United States upon termination of the license issued to such licensee the total amount collected by such State from such licensee for such purpose. If such payments are required, they must be sufficient to ensure compliance with the standards established by the Commission
42 USC 2201. pursuant to section 161 x. of this Act. No State shall be required under paragraph (3) to conduct proceedings concerning any license or regulation which would duplicate proceedings conducted by the Commission.".

42 USC 2021. (f) Section 274 c. of such Act is amended by inserting the following new sentence after paragraph (4) thereof: "The Commission shall also retain authority under any such agreement to make a determination that all applicable standards and requirements have been met prior to termination of a license for byproduct material, as defined
42 USC 2014. in section 11 e. (2).".

42 USC 2021 note. (g) Nothing in any amendment made by this section shall preclude any State from exercising any other authority as permitted under the Atomic Energy Act of 1954 respecting any byproduct material, as defined in section 11 e. (2) of the Atomic Energy Act of 1954.

42 USC 2021 note. (h) (1) On or before the date three years after the date of the enactment of this Act, notwithstanding any amendment made by this title, any State may exercise any authority under State law respecting byproduct material, as defined in section 11 e. (2) of the Atomic Energy Act of 1954, in the same manner, and to the same extent, as permitted before the enactment of this Act.

(2) An agreement entered into with any State as permitted under section 274 of the Atomic Energy Act of 1954 with respect to byproduct material as defined in section 11 e. (2) of such Act, may be entered into at any time after the date of the enactment of this Act but no such agreement may take effect before the date three years after the date of the enactment of this Act.

AUTHORITIES OF COMMISSION RESPECTING CERTAIN BYPRODUCT MATERIAL

SEC. 205. (a) Chapter 8 of the Atomic Energy Act of 1954, is amended by adding the following new section at the end thereof:

42 USC 2111 et seq.

"SEC. 84. AUTHORITIES OF COMMISSION RESPECTING CERTAIN BYPRODUCT MATERIAL.—

42 USC 2114.

"a. The Commission shall insure that the management of any byproduct material, as defined in section 11 e. (2), is carried out in such manner as—

42 USC 2014.

"(1) the Commission deems appropriate to protect the public health and safety and the environment from radiological and nonradiological hazards associated with the processing and with the possession and transfer of such material,

"(2) conforms with applicable general standards promulgated by the Administrator of the Environmental Protection Agency under section 275, and

Infra.

"(3) conforms to general requirements established by the Commission, with the concurrence of the Administrator, which are, to the maximum extent practicable, at least comparable to requirements applicable to the possession, transfer, and disposal of similar hazardous material regulated by the Administrator under the Solid Waste Disposal Act, as amended.

42 USC 6901 note.

"b. In carrying out its authority under this section, the Commission is authorized to—

Rule, regulation or order.

"(1) by rule, regulation, or order require persons, officers, or instrumentalities exempted from licensing under section 81 of this Act to conduct monitoring, perform remedial work, and to comply with such other measures as it may deem necessary or desirable to protect health or to minimize danger to life or property, and in connection with the disposal or storage of such byproduct material; and

42 USC 2111.

"(2) make such studies and inspections and to conduct such monitoring as may be necessary.

Any violation by any person other than the United States or any officer or employee of the United States or a State of any rule, regulation, or order or licensing provision, of the Commission established under this section or section 83 shall be subject to a civil penalty in the same manner and in the same amount as violations subject to a civil penalty under section 234. Nothing in this section affects any authority of the Commission under any other provision of this Act.".

Civil penalty.

Ante, p. 3033.

42 USC 2282.

(b) The first sentence of section 81 of the Atomic Energy Act of 1954, is amended to read as follows: "No person may transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, own, possess, import, or export any byproduct material, except to the extent authorized by this section, section 82 or section 84.".

42 USC 2111.

42 USC 2112.

(c) The table of contents for such chapter 8 is amended by inserting the following new item after the item relating to section 83:

Supra.

"Sec. 84. Authorities of Commission respecting certain byproduct material".

AUTHORITY OF ENVIRONMENTAL PROTECTION AGENCY RESPECTING CERTAIN BYPRODUCT MATERIAL

SEC. 206. (a) Chapter 19 of the Atomic Energy Act of 1954, is amended by inserting after section 274 the following new section:

42 USC 2021.

"SEC. 275. HEALTH AND ENVIRONMENTAL STANDARDS FOR URANIUM MILL TAILINGS.—

42 USC 2022.

Rule.

"a. As soon as practicable, but not later than one year after the date of enactment of this section, the Administrator of the Environmental Protection Agency (hereinafter referred to in this section as the 'Administrator') shall, by rule, promulgate standards of general application (including standards applicable to licenses under section 104(h) of the Uranium Mill Tailings Radiation Control Act of 1978) for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with residual radioactive materials (as defined in section 101 of the Uranium Mill Tailings Radiation Control Act of 1978) located at inactive uranium mill tailings sites and depository sites for such materials selected by the Secretary of Energy, pursuant to title I of the Uranium Mill Tailings Radiation Control Act of 1978. Standards promulgated pursuant to this subsection shall, to the maximum extent practicable, be consistent with the requirements of the Solid Waste Disposal Act, as amended. The Administrator may periodically revise any standard promulgated pursuant to this subsection.

42 USC 6901 note.

Rule.

"b. (1) As soon as practicable, but not later than eighteen months after the enactment of this section, the Administrator shall, by rule, promulgate standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with the processing and with the possession, transfer, and disposal of byproduct material, as defined in section 11 e. (2) of this Act, at sites at which ores are processed primarily for their source material content or which are used for the disposal of such byproduct material.

42 USC 2014.

"(2) Such generally applicable standards promulgated pursuant to this subsection for nonradiological hazards shall provide for the protection of human health and the environment consistent with the standards required under subtitle C of the Solid Waste Disposal Act, as amended, which are applicable to such hazards: *Provided, however*, That no permit issued by the Administrator is required under this Act or the Solid Waste Disposal Act, as amended, for the processing, possession, transfer, or disposal of byproduct material, as defined in section 11 e. (2) of this Act. The Administrator may periodically revise any standard promulgated pursuant to this subsection. Within three years after such revision of any such standard, the Commission and any State permitted to exercise authority under section 274 b. (2) shall apply such revised standard in the case of any license for byproduct material as defined in section 11 e. (2) or any revision thereof.

42 USC 2021.

Publication in Federal Register.
Notice, hearing opportunity.

"c. (1) Before the promulgation of any rule pursuant to this section, the Administrator shall publish the proposed rule in the Federal Register, together with a statement of the research, analysis, and other available information in support of such proposed rule, and provide a period of public comment of at least thirty days for written comments thereon and an opportunity, after such comment period and after public notice, for any interested person to present oral data, views, and arguments at a public hearing. There shall be a transcript of any such hearing. The Administrator shall consult with the Commission and the Secretary of Energy before promulgation of any such rule.

Consultation.

Judicial review.

"(2) Judicial review of any rule promulgated under this section may be obtained by any interested person only upon such person filing a petition for review within sixty days after such promulgation in the United States court of appeals for the Federal judicial circuit in which such person resides or has his principal place of business. A copy of the petition shall be forthwith transmitted by the clerk of court to the Administrator. The Administrator thereupon shall file in the court the written submissions to, and transcript of, the written or oral proceedings on which such rule was based as provided in section 2112 of title 28, United States Code. The court shall have jurisdiction to review the rule in accordance with chapter 7 of title 5, United States Code, and to grant appropriate relief as provided in such chapter. The judgment of the court affirming, modifying, or setting aside, in whole or in part, any such rule shall be final, subject to judicial review by the Supreme Court of the United States upon certiorari or certification as provided in section 1254 of title 28, United States Code.

5 USC 701 *et seq.*

"(3) Any rule promulgated under this section shall not take effect earlier than sixty calendar days after such promulgation.

"d. Implementation and enforcement of the standards promulgated pursuant to subsection b. of this section shall be the responsibility of the Commission in the conduct of its licensing activities under this Act. States exercising authority pursuant to section 274 b. (2) of this Act shall implement and enforce such standards in accordance with subsecton o. of such section.

42 USC 2021.

"e. Nothing in this Act applicable to byproduct material, as defined in section 11 e. (2) of this Act, shall affect the authority of the Administrator under the Clean Air Act of 1970, as amended, or the Federal Water Pollution Control Act, as amended.".

42 USC 2014.
42 USC 7401 note.
33 USC 1251 note.

(b) The table of contents for chapter 19 of the Atomic Energy Act is amended by inserting the following new item after the item relating to section 274:

42 USC 2018 *et seq.*

"Sec. 275. Health and environmental standards for uranium mill tailings.".

AUTHORIZATION OF APPROPRIATION FOR GRANTS

Sec. 207. There is hereby authorized to be appropriated for fiscal year 1980 to the Nuclear Regulatory Commission not to exceed $500,000 to be used for making grants to States which have entered into agreements with the Commission under section 274 of the Atomic Energy Act of 1954, to aid in the development of State regulatory programs under such section which implement the provisions of this Act.

EFFECTIVE DATE

Sec. 208. Except as otherwise provided in this title the amendments made by this title shall take effect on the date of the enactment of this Act.

42 USC 2014 note.

CONSOLIDATION OF LICENSES AND PROCEDURES

Sec. 209. The Nuclear Regulatory Commission shall consolidate, to the maximum extent practicable, licenses and licensing procedures under amendments made by this title with licenses and licensing procedures under other authorities contained in the Atomic Energy Act of 1954.

42 USC 2113 note.

42 USC 2011 note.

TITLE III—STUDY AND DESIGNATION OF TWO MILL TAILINGS SITES IN NEW MEXICO

STUDY

42 USC 7941.

SEC. 301. The Commission, in consultation with the Attorney General and the Attorney General of the State of New Mexico, shall conduct a study to determine the extent and adequacy of the authority of the Commission and the State of New Mexico to require, under the Atomic Energy Act of 1954 (as amended by title II of this Act) or under State authority as permitted under section 274 of such Act or under other provision of law, the owners of the following active uranium mill sites to undertake appropriate action to regulate and control all residual radioactive materials at such sites to protect public health, safety, and the environment: the former Homestake-New Mexico Partners site near Milan, New Mexico, and the Anaconda carbonate process tailings site near Bluewater, New Mexico. Such study shall be completed and a report thereof submitted to the Congress and to the Secretary within one year after enactment of this Act, together with such recommendations as may be appropriate. If the Commission determines that such authority is not adequate to regulate and control such materials at such sites in the manner provided in the first sentence of this section, the Commission shall include in the report a statement of the basis for such determination. Nothing in this Act shall be construed to prevent or delay action by a State as permitted under section 274 of the Atomic Energy Act of 1954 or under any other provision of law or by the Commission to regulate such residual radioactive materials at such sites prior to completion of such study.

42 USC 2021.

Report to Congress.

DESIGNATION BY SECRETARY

42 USC 7942.

SEC. 302. (a) Within ninety days from the date of his receipt of the report and recommendations submitted by the Commission under section 301, notwithstanding the limitations contained in section 101(6)(A) and in section 115(a), if the Commission determines, based on such study, that such sites cannot be regulated and controlled by the State or the Commission in the manner described in section 301, the Secretary may designate either or both of the sites referred to in section 301 as a processing site for purposes of title I. Following such designation, the Secretary may enter into cooperative agreements with New Mexico to perform remedial action pursuant to such title concerning only the residual radioactive materials at such site resulting from uranium produced for sale to a Federal agency prior to January 1, 1971, under contract with such agency. Any such designation shall be submitted by the Secretary, together with his estimate of the cost of carrying out such remedial action at the designated site, to the Committee on Interior and Insular Affairs and the Committee on Interstate and Foreign Commerce of the House of Representatives and to the Committee on Energy and Natural Resources of the Senate.

Submittal to congressional committees.

(b)(1) No designation under subsection (a) shall take effect before the expiration of one hundred and twenty calendar days (not including any day in which either House of Congress is not in session because of an adjournment of more than three calendar days to a day certain or an adjournment sine die) after receipt by such Committees of such designation.

(c) Except as otherwise specifically provided in subsection (a), any remedial action under title I with respect to any sites designated under this title shall be subject to the provisions of title I (including the authorization of appropriations referred to in section 112(b)).

Approved November 8, 1978.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 95-1480, Pt. I (Comm. on Interior and Insular Affairs) and Pt. II (Comm. on Interstate and Foreign Commerce).

CONGRESSIONAL RECORD, Vol. 124 (1978):
- Oct. 3, considered and passed House.
- Oct. 13, considered and passed Senate, amended.
- Oct. 14, House concurred in Senate amendment with amendments.
- Oct. 15, Senate concurred in House amendment.

UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

KERR-McGEE NUCLEAR CORPORATION,
et al.,

Petitioners,

v.

NUCLEAR REGULATORY COMMISSION,
et al.,

Respondents.

CA No. 80-2043
and consolidated
cases

AFFIDAVIT OF HUBERT J. MILLER

State of Maryland)
)
County of Montgomery)

Hubert J. Miller, being duly sworn, deposes and says:

1. I am Hubert J. Miller, Chief of the High Level Waste Technical Development Branch of the Nuclear Regulatory Commission's Division of Waste Management. Previously I was head of the section of Waste Management Division's Uranium Recovery Licensing Branch which was responsible for development of both draft and final regulations on uranium milling and the supporting generic environmental impact statement.

2. I have reviewed the nineteen documents listed by plaintiff in Exhibit H attached to its Memorandum in Support of Motion for

a Stay Pending Review. None of those listed documents is required to support or is indispensible to the regulations at issue in this case -- i.e. the Uranium Mill Licensing Requirements published at 45 FR 65521. Each of the nineteen documents supplements or corroborates information presented in the draft Generic Environmental Impact Statement on Uranium Milling (GEIS). The basic data and information upon which the Uranium Mill Licensing Requirements are grounded is contained in the draft GEIS. For the most part, the nineteen listed documents were considered by the NRC only to show that it was generally aware of information being published in the broad area of uranium milling and mill tailings control, and that there was no information being developed which indicated conclusions drawn in the GEIS and in formulating regulations should be changed.

3. The first document on plaintiff's list is "Battelle - Measurement of Radon Diffusion from Uranium Mill Tailings Piles (Vol. 5, No. 2)". This document reports the development of an experimental alternative measurement technique (in-situ gamma-ray spectrometry) for empirically determining radon surface exhalation rates. It is a byproduct of the general research program conducted at Pacific Northwest Laboratory under NRC funding which is mentioned in the Summary and Conclusion sections of the Draft and Final GEIS and in Appendix G-9 of the Final GEIS. The report was reviewed by the NRC staff after issuance, but it had no bearing or influence on subsequent staff determinations; it is not a basis for any part of the regulations promulgated.

4. The second document listed is "Battelle - Diffusion and Exhalation of Radon from Uranium Tailings (Vol. 5, no. 6)". This document reports results obtained employing an experimental technique (in-situ gamma-ray spectrometry) for measuring radon surface exhalation rates at two uranium mill tailings piles. The report was produced as a result of the general research program conducted at Pacific Northwest Laboratory under NRC funding, that is mentioned in the Summary and Conclusions sections of the Draft and Final GEIS. The report was reviewed by the NRC staff after issuance. The staff determined it to be generally consistent with the extant body of scientific information on radon diffusion and exhalation from uranium mill tailings. The report and its results are described in Appendix G-9 of the Final GEIS for purposes of information and completeness, as part of the existing body of knowledge on the subject. The report was entered into the record for similar purposes.

5. Documents 3, 4, 5 and 16 are similar in subject matter. Number three is "Battelle - Prediction of the Net Radon Emission from a Model Open Pit Uranium Mine (Vol. 5, no. 6)"; number four is "Battelle - Radon-222 Emissions in Ventilation Air Exhausted from Underground Uranium Mines (Vol. 5, no. 7)"; document number 5 is "Battelle - An Investigation of Radon-222 Emissions from Underground Uranium Mines (Vol. 5, no. 8)', and, the sixteenth listed document is "NUREG/CR-1583 - Radon Release and Dispersion from an Open Pit Uranium Mine (Vol. 8, no. 2)". These reports

describe the results of measurement, experimental, and modeling studies on the subject of radon releases from mines. They form no part of the basis for the regulations proposed or promulgated as those regulations do not address the issue of radon releases from mines.

6. The sixth listed document is "EPA - Particle Size Distribution of Yellowcake Emissions at the United Nuclear-Churchrock Uranium Mill (Vol. 6, no. 1)". This document reports on measured release rates and particle size distributions of yellowcake releases from one uranium mill. The report is a product of the general NRC research program conducted on uranium mining and milling that is mentioned in the Draft and Final GEIS Summary and Conclusions sections and in Appendix G-9, Overview of Uranium Mill Research Activities, where its content and results are described for purposes of information and completeness. The only regulation criterion of the promulgated regulation to which this report relates is Criterion 8 and only in that it covers the same subject matter. Criterion 8 is non-numerical and is not based upon any strict numerical formulations. Staff conclusions were reached independently of the information contained in this report and were not altered as a result of it.

7. Document number seven is listed as "ANL - Radioisotopic Composition of Yellowcake - An Estimation of Stack Release Rates (Vol. 6, no. 2)". This report describes the results of experimental analysis of the radioisotopic composition of yellowcake

samples obtained from uranium mills. The report is a product of the general research program on mining and milling conducted at Argonne National Laboratory (ANL) under NRC funding that is mentioned in the Summary and Conclusions sections of the Draft and Final GEIS and in Appendix G-9, Overview of Uranium Mill Research Activities, where its content and results are described for purposes of information and completeness. The only criterion of the promulgated regulations to which this report relates is Criterion 8 and only in that it covers the same subject matter. Criterion 8 is non-numerical and is not based upon any strict numerical formulations. The report had no effect on the final outcome of the staff's deliberations and no effect on the regulations promulgated.

8. Documents eight and nine are related. Number eight is listed as "ANL - Radon and Radon-Daughter Concentrations in Air in the Vicinity of the Anaconda Uranium Mill (Vol. 6, no. 3)", and number nine is "ANL - Appendix to Radon and Radon-Daughter Concentrations in the Vicinity of the Anaconda Uranium Mill (Vol. 6, no. 4)". These reports describe the results of a program for the measurement of radon and radon-daughter concentrations in the vicinity of the Anaconda uranium mill. Document no. 8 is specifically

referenced in Appendix G-9 of the Final GEIS, Overview of Uranium Mill Research Activities. Both documents are products of the general research program conducted by Argonne National Laboratory, under NRC funding, which is mentioned in the Summary and Conclusions sections of the Draft and Final GEIS. The results are reported in Appendix G-9 for purposes of information and completeness. These reports were reviewed by the staff after issuance; the staff determined them to be consistent with the existing body of scientific knowledge on the subjects addressed. The regulations promulgated were not dependent on the report and staff conclusions were not affected by it.

9. "ORNL - The Uncertainty Associated with Selected Environmental Transport Models (Vol. 6, no. 6)" is the tenth document listed by plaintiffs. This document reviews the state of knowledge with respect to the accuracy of atmospheric transport models. It is not referred to in the Draft GEIS and is referenced in the Final GEIS only in support of a response to a comment (see p. A-20, third comment and response, Appendix A, Section 4.2). The document forms no part of the basis for the regulations and had no effect on them.

10. The eleventh document on plaintiff's list in Exhibit H is "NUREG/CR-1495 - Model Assessment of Alternatives for Reducing Seepage from Buried Uranium Mill Tailings at the Morton Ranch Site In Central Wyoming (Vol. 6, no. 10)". This report documents computer modeling evaluations of seepage from a proposed tailings

impoundment under varying conditions and for varying degrees of seepage control. This relates to Criterion 5 in the regulations which is a non-numerical criterion expressing the need for seepage control and groundwater protection. Document eleven relates to Criterion 5 only in that it treats the same general subject area. Criterion 5 is fully supported by other documentation and analyses in the GEIS and is not founded on document eleven.

11. Document twelve is "NUREG/CR-1494 - Interaction of Uranium Mill Tailings Leachate with Soils and Clay Liners (Vol. 6, no. 11)". This report documents results of research into the effects acid leach tailings solutions have on clay materials used for seepage control liners in tailings piles. It also examines the behavior of tailings contaminant transport through soil materials. The document relates to Criterion 5 in the regulations in that it treats the same general subject area. The criterion is a non-numerical criterion which expresses the need for seepage control and groundwater protection. Document twelve supplemented information presented in the sections of the Draft GEIS which provide support for this criterion (i.e., Sections 6.2.4.2, 9.3.4.2 and 12.3.4, and Appendix E of the Draft GEIS).

12. Document thirteen is "NUREG/CR-1081 - Characterization of Uranium Tailings Cover Materials for Radon Flux Reduction". This document summarizes research aimed at determining the radon attenuation qualities of various earthen materials. It presents relationships between thickness of soil cover on top of tailings

and radon release rates. It relates to Criterion 6 of the regulations which deals with tailings cover requirements. Criterion 6 was derived by consideration of a broad range of public health and cost perspectives developed in the GEIS and not simply by use of mathematical formulas. This criterion did not change from draft to final regulation. In general the information in this document is consistent with that presented or referenced in the Draft GEIS on the same subject and which, by itself, supports the tailings cover limits.

13. Document fourteen is "FBDU-258 - Radon Diffusion and Cover Material Effectiveness for Uranium Tailings Stabilization (Vol. 7, no. 5)". This report documents a broad investigation into the effectiveness of various cover materials in attenuating radon. It relates to Criterion 6 in the regulations, but only in that it treats the same subject matter. It reports information which is similar to that presented extensively or referenced in the Draft GEIS. It was not cited in the GEIS and was not used as a basis for the rule.

14. Document fifteen is "ORNL/TM-7065 - Removal of Hazardous Radionuclides from Uranium Ore and/or Mill Tailings (Vol. 7, no. 7)". This report documents research into various chemical processing techniques for extracting hazardous elements from tailings. It relates to the broad decision to reject the so-called "potential reduced care mode" of tailings disposal considered in the GEIS. (*See* Sections 12.3.3 and 12.3.3.3.) This mode of tailings disposal

was found to be excessively costly. Document fifteen merely supplements those similar documents cited in the Draft GEIS which were used in making this cost determination. It is referenced in Appendix B of the Final GEIS for informational purposes.

15. The seventeenth listed document is "NUREG/CR-1253 - Battelle - Methods for Assessing Background Levels of Radiation and Radioactive Materials in the Environment Around Uranium Mills (Vol. 8, no. 4)". This document is a survey-type report on methods of measuring background radiation levels. It is not referenced in either the Draft or Final GEIS, and is not a part of the basis for the promulgated regulations.

16. Document number 18 on plaintiff's list is "Letter Fort to Eadie and draft copy of ORP-LVF Report (Vol. 8, no. 5)". The Report was made available to the staff in draft form by letter from C. W. Fort, Jr., of EPA, dated March 31, 1980, and eventually published in October, 1980. The work reported in this letter was performed as part of a general research program on uranium mining and milling sponsored by NRC that is mentioned in the Summary and Conclusions of the Draft and Final GEIS. At the time the Draft GEIS was published, the staff was aware that such a report was in preparation and referenced it in that fashion (see Draft GEIS p. 31 and p. G-14). The general results of the EPA studies were incorporated into a report of Argonne National Laboratory, NUREG/CR-1216 (December 1979), which is referenced in the Final GEIS (see pages G-6 and G-72 of the Final GEIS). The only criterion of the

promulgated regulations to which this report relates is Criterion 8 and only in that it covers the same subject matter. Criterion 8 is non-numerical and is not based upon any strict numerical formulations. Staff conclusions were reached independently of the information contained in this report and were not altered as a result of it.

17. The last document on plaintiff's list is "Letter from Myrick to Miller and Figures concerning 226 Ra soil with attachment (Vol. 8, no. 6)". This document presents data on radium in soil measurements made by Oak Ridge National Laboratory for the Department of Energy (DOE) in background locations in uranium milling regions. These data were available in summary form in Appendix O of the Draft GEIS. This report relates to Criterion 6 of the regulations which contain uranium mill tailings cover requirements. The basis for Criterion 6 is that presented in the Draft GEIS.

I declare under penalty of perjury that the foregoing is true and correct.

Hubert J Miller

HUBERT J. MILLER
Chief, High Level Waste
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Date: MAY 13, 1981

EXHIBIT C

UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

KERR-McGEE NUCLEAR CORPORATION, et al.,

Petitioners,

v.

NUCLEAR REGULATORY COMMISSION, et al.,

Respondents.

CA No. 80-2043
and consolidated
cases

MEMORANDUM IN SUPPORT OF MOTION FOR A STAY PENDING REVIEW

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UNITED STATES COURT OF APPEALS
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Petitioners,

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MOTION FOR STAY PENDING REVIEW

Petitioners Kerr-McGee Nuclear Corporation, United Nuclear Corporation and Western Nuclear, Inc. hereby move this Court to stay the Uranium Mill Licensing Requirements, 45 Fed. Reg. 65521-38 (Oct. 3, 1980), promulgated by the Nuclear Regulatory Commission, pending a final determination on the merits in this proceeding. The stay requested by petitioners is authorized under 28 U.S.C. § 2349(b), 5 U.S.C. § 705, and Rule 18 of the Federal Rules of Appellate Procedure. It is necessary in order to protect the rights of petitioners during the pendency of this proceeding. The grounds for the stay are more fully set forth in the accompanying Memorandum.

Respectfully submitted,

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UNITED STATES COURT OF APPEALS
FOR THE TENTH CIRCUIT

KERR-McGEE NUCLEAR CORPORATION, et al.,

Petitioners,

v.

NUCLEAR REGULATORY COMMISSION, et al.,

Respondents.

CA No. 80-2043
and consolidated
cases

MEMORANDUM IN SUPPORT OF MOTION FOR A STAY PENDING REVIEW

This memorandum supports a motion for a stay pending review of the Uranium Mill Licensing Requirements, 45 Fed. Reg. 65,521-38 (October 3, 1980),[1] promulgated by the Nuclear Regulatory Commission (NRC) under the Atomic Energy Act of 1954, 42 U.S.C. §2011 et seq., as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRC Act), 92 Stat. 3021. Petitioners' motion is triggered by NRC's recent actions to compel states which currently regulate uranium tailings (Agreement States)[2] precipitously to adopt NRC's Uranium Mill Licensing Requirements as "minimum national standards."[3] In the absence of a stay, either the Agreement States will be forced to make nugatory determinations concerning the practicability of the NRC regulations (in contravention of the UMTRC Act) or NRC will revoke their authority over uranium milling. In either event, extremely burdensome and unreasonable requirements will be imposed on the petitioners, who own and operate uranium mills in Agreement States.

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[1] To be codified in 10 C.F.R. Parts 30, 40, 70 and 150.

[2] In 1959, Congress added Section 274, 42 U.S.C. § 2021, to the Atomic Energy Act to provide for state regulation of certain of the activities previously within the exclusive jurisdiction of the Atomic Energy Commission (AEC). (The AEC was abolished in 1974 and its regulatory jurisdiction was transferred to NRC. Compare 42 U.S.C. § 5814(g) with id. § 5841(f).) Section 274 authorized the AEC to enter into agreements with states ("Agreement States") by which federal regulatory authority under the Atomic Energy Act over certain nuclear materials and plants, including uranium mills, is discontinued and regulatory authority is assumed by the states. Some 26 agreements (Footnote 2 continued on next page)

This Court has the authority to grant a stay of the Uranium Mill Licensing Requirements under 28 U.S.C. §2349(b), 5 U.S.C. §705, Rule 18 of the Federal Rules of Appellate Procedure, and other applicable authorities. *See Superior Trucking Co., Inc.* v. *United States*, 614 F.2d 481 (5th Cir. 1980). Pending its review and final determination regarding such regulations, the Court should grant a stay.[4]

(Footnote 2 continued)
have been entered pursuant to this provision, including agreements covering such important uranium-producing states as New Mexico, Colorado, Washington, and Texas. *See* 39 Fed. Reg. 15743 (April 26, 1974) (New Mexico); 33 Fed. Reg. 2400 (Jan. 31, 1968) (Colorado); 31 Fed. Reg. 16375 (Dec. 22, 1966) (Washington); 28 Fed. Reg. 531 (Jan. 29, 1963) (Texas). "Much of the milling industry is currently licensed through States under the Agreement States Program . . . ." *Hearings on H.R. 13382, 12938, 12535 and 13049 before the Subcommittee on Energy and the Environment of the House Committee on Interior and Insular Affairs,* 95th Cong., 2d Sess., at 130 (1978).

[3] Letter from John F. Ahearne, Chairman, NRC, to Bruce King, Governor of New Mexico (January 29, 1981), Exhibit A.

[4] In compliance with Federal Rule of Appellate Procedure 18, petitioners have applied to NRC for a stay of the Uranium Mill Licensing Requirements. Petitioners have advised the agency that they intended to promptly move this Court to stay the regulations in the event that NRC was unable to act favorably with respect to the application. *See* letter attached in Exhibit B. As of this date, NRC has not acted upon petitioners' application. It is not practicable for petitioners further to postpone filing this motion in view of NRC's current stance requiring New Mexico and other Agreement States to adopt the regulations at issue and in view of NRC's imposition of various costly requirements contained in the regulations upon its licensees.

I. THE STAY REQUESTED BY THE PETITIONERS IS NECESSARY TO PREVENT THE USURPATION BY THE NRC OF RESPONSIBILITIES THAT WERE ASSIGNED BY THE CONGRESS TO EPA AND THE STATES AND TO ASSURE THAT PETITIONERS WILL BE ABLE TO PARTICIPATE MEANINGFULLY IN EPA AND STATE RULEMAKING PROCEEDINGS.

In establishing a regulatory program to govern uranium tailings under Title II of the UMTRC Act, Congress provided for a tripartite division of authority among the Environmental Protection Agency (EPA), NRC, and the Agreement States. EPA was directed to develop "standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with [uranium tailings]." 42 U.S.C. § 2022(b). The responsibility for implementing and enforcing such general standards was given to NRC and the Agreement States. 42 U.S.C. § 2022(d).

EPA has not yet promulgated, or even proposed, general standards for active sites.[5] NRC nevertheless has adopted the Uranium Mill Licensing Requirements under review in this proceeding. Furthermore, NRC is now attempting to compel the Agreement States to adopt those regulations without permitting those states to make determinations required under the UMTRC Act. Unless this Court stays the regulations at issue here, NRC will turn on its head the division of responsibility prescribed by Congress and deprive petitioners of significant substantive and procedural rights.

A. NRC's Regulations Must Be Stayed In Order To Preserve The Authority of Agreement States and Petitioners' Right to Participate in Meaningful State Proceedings.

Under Section 274(o)(2) of the Atomic Energy Act, 42 U.S.C. § 2021(o)(2), as amended by Section 204 of the UMTRC Act, the Agreement States are required to adopt regulations that "are equivalent, to the extent practicable, or more stringent than" NRC and EPA regulations governing uranium tailings. (Emphasis added.) Under this provision, valid federal regulations are a point of departure for state rulemaking. But the states have more to do than merely copy such regulations. They must determine if the federal standards are practicable under local conditions. As the language quoted above makes clear, alternative and less stringent state requirements are permissible if the federal regulations are not practicable.

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[5] EPA has recently proposed general standards for inactive sites. 46 Fed. Reg. 2556-63 (Jan. 9, 1981).

NRC has recently attempted to subvert this rulemaking authority of the Agreement States by requiring the states precipitously to adopt the Uranium Mill Licensing Requirements. In a letter to the governors of four Agremeent States (New Mexico, Colorado, Washington and Texas), former NRC Chairman Ahearne has established a "target date" of August 1, 1981, for the adoption by the states of uranium tailings regulations "which are equivalent to, or more stringent than, those of Commission."[6] The Chairman's omission of the statutory reference to practicability is evidently explained in an attachment to his letter. That attachment announces that "[t]he Commission considers that its recently promulgated [uranium tailings] regulations are practicable to implement in Agreement States . . . . The Commission regulations constitute minimum national standards."[7] The penalty for failure to comply with these instructions is loss of the state's regulatory authority over uranium tailings.

NRC's attempt to portray its regulations to the Agreement States as binding "minimum national standards" overstates its statutory authority. The original version of the pertinent UMTRC Act provisions would have

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6. Letter, *supra* note 3.

7. *Id*. Similar letters were sent to the governors of Colorado, Washington and Texas, Exhibits C, D and E. Petitioners have been informed that NRC intends to send similar letters to three additional state governors. *See* letter from G. Wayne Kerr to Charles H. Montange (March 12, 1981), Exhibit F.

accorded federal officials power to issue such standards.[8] However, a number of the Agreement States objected to this concept and language.[9] Congress then added to the final version a provision that the Agreement States need adopt the federal regulations only "to the extent practicable." Congress thus "expressly declined to enact" the position NRC now espouses, and the Commission's current efforts constitute nothing more than an attempt to circumvent a key concession by Congress to the authority of Agreement States Compare Gulf Oil Corp. v. Copp Paving Co., 419 U.S. 186, 200 (1974).

NRC's position is highly prejudicial and unlawful for another reason. A central issue at any state proceeding on the NRC regulations in question here is whether those regulations are practicable for the state in question. If that issue is not open to public participation, the state proceedings are nugatory. Even if the issue were open, NRC is demanding such hurried action as to render the proceedings nugatory. NRC would force states to proceed in improper haste, notwithstanding that (1) NRC took two years to develop its regulations, (2) EPA has not yet developed standards on which those regulations are supposed to be based, and (3) Congress clearly intended to afford Agreement States at least 18 months to adopt regulations responding to federal UMTRC Act standards.[10] In order to comply with

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[8] See Hearings, supra note 2, at 129 (original bill required state standards "at least equivalent to standards adopted and enforced by [NRC]"). See also Hearings on H.R. 11698, 12229, 12938, 12535, 13049 and 13650 before the Subcommittee on Energy and Power of the House Committee on Interstate and Foreign Commerce, 95th Cong., 2d Sess., at 351 and 359 (1978) (NRC support for similar language); 124 Cong. Rec. S15334 (daily ed. Sept. 18, 1978) (similar language in Senate version).

[9] See Hearings, supra note 2, at 136.

[10] Congress gave EPA an 18-month deadline (until May 8, 1980) to promulgate standards governing tailings at active sites such as those owned by petitioners. 42 U.S.C. § 2022(b). In order to assure that
(Footnote 10 continued on next page)

NRC's fiat, Agreement States would be required to parrot NRC's regulations without scrutiny, without meaningful public comment, and without revision. Indeed, the Commission has suggested that the Agreement States substitute the record compiled by NRC for their own proceedings as a basis for state regulations.[11]

NRC's stance thus renders meaningless the provisions added by the UMTRC Act which require states to afford an opportunity for public participation in their rulemakings. 42 U.S.C. § 2021(o)(3)(B). This amounts to an unlawful denial of petitioners' right to participate in state proceedings, for it is well-established that a right to participate is unlawfully denied unless it is meaningfully accorded. Compare Oglala Sioux Tribe of Indians v. Andrus, 603 F.2d 707, 720 (8th Cir. 1979) ("meaningful consultation"); Kelly v. United States Department of the Interior, 339 F. Supp. 1095, 1101 (E.D. Cal. 1972) (opportunity for meaningful comment on agency proposal required).[12] Moreover, the NRC is affording Agreement States insufficient time even to comply with procedures required by state law. In New Mexico, for example, radiation regulations may be adopted by the "environmental

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(Footnote 10 Continued)
Agreement States would have sufficient time to develop responding regulations and afford an opportunity for public participation, Congress provided that the states need not have such regulations in place for an additional 18 months, i.e., until November 8, 1981. See 42 U.S.C.A. § 2021 note.

[11] Letter, supra note 3.

[12] The only authority offered by NRC for its edict to the governors is a claim that the Commission "considers" its regulations to be practicable in the Agreement States. This claim is set forth in an attachment to correspondence and is based on no official action of the NRC. Because this purported determination by NRC has not previously been disclosed to the public and was not the subject of notice-and-comment rulemaking as required under the Atomic Energy Act, it is invalid. Pickus v. United States Board of Parole, 507 F.2d 1107 (D.C. Cir. 1974) (failure to comply with APA renders regulations invalid).

improvement board" only after there has been a public hearing, with 30 days notice and an opportunity for all interested persons to submit data and examine witnesses testifying at the hearing (NMSA 1978, §74-1-9), and only after the "radiation techical advisory council," which advises the board on technical matters, has given its advice and consent to the regulations (NMSA 1978, §74-3-5).[13] Unless this Court stays the NRC regulations, the petitioners will be deprived of their right to participate in meaningful and lawful state proceedings addressing the NRC regulations and their practicability.

B. NRC's Actions Unlawfully Undermine the Authority of EPA and Deprive Petitioners of their Right to a Meaningful Hearing on EPA Standards.

Congress assigned a central role to EPA in the regulation of uranium tailings under the UMTRC Act: the development of general standards that NRC and the Agreement States would implement in the form of more specific regulations and license requirements. EPA was specifically directed to "promulgate standards of general application for the protection of the public health, safety, and the environment from radiological and nonradiological hazards associated with [uranium tailings]." 42 U.S.C. § 2022(b)(1). In turn, the implementation and enforcement of the EPA standards was to be the responsibility of NRC and the Agreement States, 42 U.S.C. § 2022(d), and NRC was directed to assure that the management of uranium tailings "conforms with applicable general standards promulgated by [EPA]." 42 U.S.C. § 2114. The only reasonable interpretation of these provisions is that Congrtended EPA to act first and that EPA, rather than NRC, was to devie pertinent general standards. This is confirmed by the statute, wlquires EPA to act "as soon as practicable, but not later than eightnths after [November 8, 1978]." 42 U.S.C. § 2022(b)(1). No such cot was placed upon NRC. The priority of EPA's responsibility is alsrmed by the legislative history, which indicates that nothing in the Act was intended to undercut EPA's role, conferred by Reorganizatn No. 3 of 1970,[14] to establish generally applicable standards for N implement.[15]

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[13] Responding to Chairman Ahearne's letter, supra note 3, Governor King of New Mexico stated: "we must follow our public hearing process. Due to the delay in the Commission publishing its final rules, it may be appropriate to consider advising Congress that the Commission's actions have occupied the majority of the three year action period and request additional time for state action." Letter from Bruce King to John F. Ahearne (February 23, 1981), Exhibit G.

NRC uly circumvented EPA's function in adopting its own regulations in the e of EPA standards. That action is directly contrary to Section 275 Atomic Energy Act. Moreover it subjects the industry, its employees the public to the prospect of inconsistent and shifting regulatory requirements and unnecessary economic losses.[16] This is directly contrary to the intent of Congress that kaleidoscopic regulatory requirements be avoided.[17] NRC's action quite plainly usurps the role of EPA in the statutory scheme devised by Congress. The NRC regulations are accordingly invalid.

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[14] EPA waslished by Reorganization Plan No. 3 of 1970. See 35 Fed. Reg. 15 Stat. 2086, 42 U.S.C.A. § 4321 note. The Reorganization Plans terms transferred to EPA authority to set generally applicabation standards under the Atomic Energy Act. See Section 2 of the Plan.

[15] See, e.grings on H.R. 11698, 12229, 12938, 12535, 13049 and 13650, suote 8, at 343, 366 and 396. Indeed, NRC repeatedly and specificallosed draft UMTRC Act legislation which would have conferredard-setting authority upon it rather than EPA. See Hearings,a note 2, at 78 (NRC Chairman Hendrie terms legislation assigning standard-setting task to the NRC with EPA in the consulting r an "undesirable reversal of the present regulatory roles of the twcies"). See also Hearings on S. 3008, 3078 and 3257 before thommittee on Energy Production and Supply of the Senate Ce on Energy and Natural Resources, 95th Cong., 2d Sess. at 78) (same). It is noteworthy that Senator McClure specificalonished against "duplicative regulatory procedures. We do not wa see NRC out there doing exactly what EPA is required to do ang." 124 Cong. Rec. S15324 (daily ed. Sept. 18, 1978).

By putting the cart before the horse, NRC has also subverted the right of petitioners and other interested parties (guaranteed in Section 206(a) of the UMTRC Act, 42 U.S.C. § 2022(c)) to participate in meaningful rulemaking proceedings leading to the adoption of the EPA standards. NRC's action predisposes EPA to adopt standards supportive of the NRC enactments and thus prejudicially undercuts EPA's ability to impartially and objectively develop standards for uranium mill tailings.[18]

In sum, NRC's actions not only contravene the division of authority established by Congress, but also would deny the petitioners their statutory rights to participate in rulemaking proceedings of EPA and the Agreement

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[16] NRC has claimed that it has authority to issue standards independent of those of EPA. 45 Fed. Reg. 65521, 65,523 (October 2, 1980). NRC has provided no specific basis for this claim, and, indeed, there is no basis. The Commission has repeatedly explained that authority to set general standards under the Atomic Energy Act rests with EPA under Reorganization Plan No. 3 of 1970. See, e.g., note 15, supra.

[17] Congressman Dingell, Chairman of the House Subcommittee on Energy and Power, specifically stressed that shifting UMTRC Act regulatory standards were to be avoided. He urged the responsible federal agency (EPA) to "come up with one set of standards . . . so that the rules won't change on operators." Hearings on H.R. 11698, 12229, 12938, 12535, 13049 and 13650, supra note 8, at 393.

[18] One agency clearly may not take actions prejudicing the objectivity of another agencies in carrying out their statutory duties. See, e.g., Keith v. Volpe, 352 F. Supp. 1324, 1355 (C.D. Cal. 1972), aff'd sub nom. Keith v. California Highway Commission, 506 F.2d 696 (9th Cir. 1974) (en banc) (state agency may not prejudice highway location and NEPA decisions by acquiring right-of-way prior to compliance with various hearing and review requirements); National Wildlife Federation v. Snow, 561 F.2d 227, 238 (D.C. Cir. 1976) (same).

States. A stay is necessary to preserve petitioners' rights, as well as to prevent the disruption of rulemaking proceedings in the Agreement States.

II. THE NRC UNLAWFULLY SUPPRESSED MEANINGFUL COMMENT ON ITS URANIUM MILL LICENSING REQUIREMENTS

NRC's regulations are invalid because of a fundamental procedural flaw: the Commission relied upon scientific studies not disclosed to the public for comment. At least 19 scientific reports are included in NRC's "Certified Index of the Record" that were not and could not have been available for public comment.[19] These reports, which constitute a majority of the scientific reports listed by NRC, were not in the docket file until well after the close of the comment period.[20] Indeed, most of NRC's studies were not even completed until after the comment period.

NRC's reliance upon these documents is particularly unwarranted in view of the request that was made for an extension of the comment period to permit interested parties to review and comment upon unpublished studies cited by NRC but not available to the public.[21] This request was denied by NRC on the grounds that the analysis and conclusions of the Commission were based on available references and not on information from unpublished research reports.[22] Yet the cited studies that were unavailable during the comment period are now listed by NRC in its certified index as the basis for the contested regulations.

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[19] A complete list of these reports is attached as Exhibit H.

[20] See 44 Fed. Reg. 50015 (Aug. 24, 1979) (comment period closed on October 24, 1979).

[21] Letter from Mr. Bogden, Director of Environmental and Industrial Safety, Western Nuclear, Inc. to Mr. Martin (NRC) (May 24, 1979), Exhibit I.

[22] Letter from Mr. Martin (NRC) to Mr. Bogden (June 29, 1979), Exhibit J.

Failure to disclose the information on which an agency relies for rulemaking purposes violates the Administrative Procedure Act, deprives interested parties of their right to make meaningful comments, and requires a remand of the regulations. See, e.g., U.S. Lines v. Federal Maritime Commission, 584 F.2d 519, 534 (D.C. Cir. 1978). "It is not consonant with the purpose of a rulemaking proceeding to promulgate rules on the basis of inadequate data, or on data that, [to a] critical degree, is known only to the agency." Portland Cement Ass'n v. Ruckelshaus, 486 F.2d 375, 393 (D.C. Cir. 1973), cert. denied, 417 U.S. 921 (1974). This is especially true with respect to a proposed rule based on scientific information. In such cases,

> "the scientific material which is believed to support the rule should be exposed to the view of interested parties for their comment. One cannot ask for comment on a scientific paper without allowing the participants to read the paper. Scientific research is sometimes rejected for diverse inadequacies of methodology; and statistical results are sometimes rebutted because of a lack of adequate gathering technique or of supportable extrapolation. Such is the stuff of scientific debate. To suppress meaningful comment by failure to disclose the basic data relied upon is akin to rejecting comment altogether. For unless there is a common ground, the comments are unlikely to be of a quality that might impress a careful agency. The inadequacy of comment in turn leads in the direction of arbitrary decisionmaking." United States v. Nova Scotia Food Products Corp., 568 F.2d 240, 252 (2d Cir. 1977).

The arbitrariness of the NRC regulations, based on unwarranted technical assumptions and conclusions, will be demonstrated in the petitioners' arguments on the merits in these proceedings. At the present stage, the deficiency in the NRC rulemaking proceedings -- a deficiency that is apparent on the face of the record -- constitutes independent grounds for a stay of the regulations.[23]

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[23] See, e.g., Universal Specialties, Inc. v. Blount, 331 F. Supp. 52 (C.D. Cal. 1971) (three-judge court) (preliminary injunction against regulations adopted in contravention of APA).

III. A STAY OF THE URANIUM MILL LICENSING REQUIREMENTS IS NECESSARY TO PRESERVE THE STATUS QUO.

The petitioners face a situation in which they have effectively been deprived of their right to participate in rulemaking proceedings of EPA and NRC as a result of NRC's unlawful adoption of final regulations governing uranium tailings. Moreover, the petitioners will be prejudiced in rulemaking proceedings of the Agreement States (a hearing in New Mexico has been announced for June 11, 1981) as a result of NRC's attempts to hastily impose those regulations on the states without the required determinations of practicability in each jurisdiction. The efforts of the Agreement States to exercise their regulatory authority over uranium tailings will be disrupted. Moreover, the petitioners will shortly become subject to unwarrantedly burdensome and unreasonable regulations, without any possibility for compensation when the regulations are subsequently invalidated in a review on the merits.

These conditions require a stay to preserve the status quo ante litem under the tests enunciated by this Court in several recent cases. The purpose of such a stay is "to preserve the status quo pending a final determination of the rights of the parties," Lundgrin v. Claytor, 619 F.2d 61, 63 (10th Cir. 1980). It is appropriate when (i) there are "questions going to the merits so serious, substantial, difficult and doubtful as to make them fair ground for litigation and thus for more deliberate investigation," Lundgrin v. Claytor, supra at 63; Continental Oil Co. v. Frontier Refining Co., 338 F.2d 780, 781-2 (10th Cir. 1964), citing Hamilton Watch Co. v. Benrus Watch Co., 260 F.2d 736, 740 (2d Cir. 1953), and (ii) hardships will be minimized by the issuance of the stay.[24]

The petitioners have demonstrated above that the NRC actions raise "serious, substantial, difficult and doubtful" questions that will constitute "fair ground for litigation" in proceedings on the merits before this Court. A stay is also required to minimize hardships. Petitioners will sustain significant injury and irreparable harm unless this motion for a stay is granted. In the absence of a stay, their statutory and due process rights to an opportunity for meaningful comment upon UMTRC Act-related proposals before Agreement State regulatory bodies and EPA will be abridged. In addition, imposition of the NRC regulations prior to a final determination of their validity by this Court will result in enormous costs to petitioners. Those costs will necessarily depend on the length of time required by this Court to reach a decision. However, it is reasonable to assume that at least one year will be required for this purpose.[25] The regulations will increase the cost of uranium concentrates produced by mills by three percent or more

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[24] The question of minimization of hardships is frequently subdivided into three constituents: whether the moving party will sustain uncompensated (irreparable) injury if the stay is not issued; whether the threatened injury to the moving party will outweigh whatever injury will occur to the opposing party if the stay is issued; and whether entry of the stay is consistent with the public interest. Lundgrin v. Claytor, 619 F.2d 61, 63 (10th Cir. 1980); Valdez v. Applegate, 616 F.2d 570, 572 (10th Cir. 1980); Washington Metropolitan Area Transit Commission v. Holiday Tours, Inc., 539 F.2d 841, 843 (D.C. Cir. 1977), citing Virginia Petroleum Jobbers Association v. FPC, 259 F.2d 921, 925 (D.C. Cir. 1958).

[25] NRC is currently in the process of implementing the regulations with its licensees (e.g., imposition of requirements at Western Nuclear's Jeffrey City, Wyoming mill). Moreover, numerous mills will be subject to relicensing during the upcoming year (e.g., Kerr-McGee's Ambrosia Lake facility). Thus, imposition of the NRC regulations is imminent.

(i.e., approximately $100,000,000 or more per year).[26] Imposition of the NRC regulations will also result in substantial harm to workers and to the public. For example, the NRC regulations generally bar disposal of tailings in a fashion that results in contact with groundwater.[27] But Kerr-McGee, United Nuclear and other uranium millers typically employ tailings for backfill in underground uranium mines. Since such mines are located in aquifers, backfilling operations necessarily involve contact between the tailings and groundwater. This use of tailings, which NRC would regulate, is essential to protect underground miners from injury and death due to mine cave-ins; to safeguard aquifers above the ore zone from subsidence; and to maximize recovery of uranium by permitting mining of formations surrounding a backfilled area.

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[26] See, e.g., Testimony of Gordon T. Swanby on behalf of the American Mining Congress at the NRC's hearings on the Draft Generic Environmental Impact Statement (Exhibit K), 6, in Comments of the American Mining Congress, Document No. 1, Vol. 2, NRC Certified Index. Two examples serve to illustrate the immediate adverse impact that will result from imposition of the Uranium Mill Licensing Requirements. First, the regulations provide that existing uranium mills must "alleviate conditions that lead to excessive seepage impacts [from tailings piles] and restore ground water quality to its potential use before milling operations began to the maximum extent practical." 45 Fed. Reg. 65534 (Oct. 3, 1980) (criterion 5). This provision demands immediate and costly process changes and water treatment systems. For example, NRC is in the process of applying criterion 5 to Western Nuclear's Jeffrey City, Wyoming mill. The agency is requiring Western to install an elaborate groundwater monitoring and control system at a minimum cost of $350,000. The annual expense for operating the system (including sampling and laboratory analyses) is expected to be in excess of $250,000 per year. Second, the regulations call for all uranium mills immediately to make "financial surety arrangements" to cover the cost of "decontamination and decommissioning of the mill and site and for reclamation of any tailings or waste disposal areas." Id. at 65535 (criterion 9). However, NRC's regulations bar self-insurance. Id. The required surety arrangements thus will necessarily involve substantial and unrecoverable expenses (e.g., surety bond premiums) in securing a surety through a third-party.

[27] 45 Fed. Reg. 65534 (Oct. 3, 1980) (criterion 5). This criterion states, among other things, that "the primary method of protecting groundwater shall be isolation of tailings and tailings solutions" and that "disposal involving contact with groundwater will be considered" only if "tests and analyses" demonstrate that groundwater will not be degraded "from current or potential uses." This criterion on its face does not permit sand backfilling where water quality would be degraded even if such backfilling is essential to protect the lives of workers and overlying aquifers.

No remedy in the form of monetary damages is available to compensate petitioners, their employees or the public for these injuries and, in any event, the harms are not susceptible to accurate measurement by pecuniary standards. They thus constitute irreparable injury for purposes of preliminary relief. See, e.g., National Tank Truck Carriers, Inc. v. Burke, 608 F.2d 819, 825 (1st Cir. 1979) (irreparable injury where party could not recover expenses it would incur if the regulations in question were not enjoined); Danielson v. Local 275, 479 F.2d 1033, 1037 (2d Cir. 1973) (irreparable injury "where monetary damages are difficult to ascertain or are inadequate"); Boston Professional Hockey Ass'n, Inc. v. Cheever, 472 F.2d 127, 128 (1st Cir. 1972) (same); MPI, Inc. v. McCollough, 463 F. Supp. 887, 902 n. 18 (N.D. Miss. 1978).

In contrast, there would be no adverse impact upon NRC or the public if the regulations were stayed. Individuals and the environment would be fully protected from hazards allegedly posed by uranium mill operations and uranium tailings under existing Agreement State regulatory programs.[28] Moreover, unnecessary and costly disruption of Agreement State regulatory programs, and the possible termination by NRC of such programs for failure to adopt the regulations as minimum national standards, would be avoided. The states have spent large sums to develop these programs, which might be lost. Since a number of companies have pending license applications in the

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[28] See letter from Bruce S. Garber, Chief Attorney, New Mexico Environmental Improvement Division, to NRC (April 15, 1981), Exhibit L.

Agreement States, the disruption of the state programs will also affect the substantial investment cost of those companies.[29]

This Court has recently also emphasized that "the public has an interest in preserving the status quo ante litem until the merits of a serious controversy can be fully considered by [the] court." Valdez v. Applegate, 616 F.2d 570, 572 (10th Cir. 1980). This is especially true where a case is, as here, "one of first impression." Compare National Tank Truck Carriers, Inc. v. Burke, 608 F.2d 819, 824 (1st Cir. 1979). The public interest demands that the status quo be preserved here until the merits of the issues presented in this litigation may be fully considered by this Court.[30]

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29. It is also noteworthy that the risks posed by staying the regulations are de minimis. According to NRC's own calculation, the most serious risk (premature death from cancer) would be increased by only 0.001% for an average individual living in the vicinity of a model-sized uranium mill for 15 years without the NRC controls at issue here. 1 Generic Environmental Impact Statement 6-39 and 49-50 (1980). Risks of this magnitude have been termed "insignificant" by NRC in the context of nuclear reactor licensing decisions. See 46 Fed. Reg. 15154, 15155, and 15167 (March 4, 1981) (increased risk of .0008% "cannot significantly affect the cost-benefit balance"). Since current or planned uranium mills are located in remote and sparsely populated areas, very few persons are subject even to this de minimis risk. See 1 Generic EIS 4-12 (1980) (description of "model region"); Descriptions of United States Uranium Resource Areas 1-1, 12-1 to 13 (1979) (Nureg/CR-0597) (vol. 8, no. 3 of "Certified Index of the Record).

30. The American Mining Congress supports the need for a stay in this proceeding.

CONCLUSION

For the reasons stated above, petitioners' motion for a stay should be granted.

Respectfully submitted,

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EXHIBIT A

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

January 29, 1981

The Honorable Bruce King
Governor of New Mexico
Santa Fe, New Mexico 87503

Dear Governor King:

On May 1, 1974, New Mexico became an Agreement State under Section 274 of the Atomic Energy Act of 1954. Under the provisions of this Act, New Mexico assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor-produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. New Mexico applied for and received a grant of $133,900 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Mr. Thomas E. Baca, Director, Environmental Improvement Division of the Department of Health & Environment, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Mr. Baca and his staff and to identify remaining actions which New Mexico must accomplish for a timely amended agreement.

As a result of information exchanged between the NRC and New Mexico, in July, 1980, we provided Mr. Baca with our initial assessment of the readiness of New Mexico for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). Additional information was provided by Mr. Baca which we have evaluated. The results of this evaluation are discussed in Enclosure 2 to this letter. I would like to highlight two of the actions still needed:

1. New Mexico has not yet promulgated complete regulations to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. Prompt action in advance of the amended agreement, as required by the UMTRCA and noted in previous NRC correspondence with the State, should be taken by New Mexico to develop upgraded tailings management programs that meet UMTRCA requirements at existing mill sites.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining New Mexico's actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by New Mexico of the application for amendment.

While, in our opinion, New Mexico has taken steps toward compliance with UMTRCA, more needs to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. W. Kerr, Director of NRC's Office of State Programs.

Sincerely,

J F Ahearne

John F. Ahearne
Chairman

Enclosures:
As stated

cc: T. Baca, New Mexico w/encls.
T. Wolff, New Mexico w/encls.

EXHIBIT A: ENCLOSURE 1

National Advisory Committe on Occupational Safety and He th; Full Committee Meeting and Sut roup Meeting

Notice is hereby given that ie National Advisory Committe on Occupational Safety and Hea h (NACOSH) will meet on Febr ary 25–27, 1981 at the Frances Perkins D partment of Labor Building, Room N44: , Third Street and Constitution Aven , N.W., Washington, D.C. The meetin s will begin at 9:00 a.m. the public i nvited to attend.

The National Advisory Cor nittee was established under Sectio 7(a) of the Occupational Safety and ealth Act of 1970 (29 U.S.C. 656) to advi e the Secretary of Labor and the Se retary of Health, Education and Welfa on matters relating to the admini ration of the Act.

Wednesday, February 25, 1 11 will be devoted to Subgroup meeting The Subgroups will discuss:

1. Reproductive Hazards.
2. Safety and Health Effects of w Energy Technologies.
3. Information Systems for NIO H/OSHA Priority Setting.

The agenda for February 26 nd 27 will include reports on OSHA nd NIOSH activities, a discussio of repeat violations, and discussions of ther safety and health matters rela ng to OSHA and NIOSH.

Written data or views conc ning these agenda items may be su mitted to the Division of Consumer Affa rs. Such documents which are receive before the scheduled meeting dates, eferably with 20 copies, will be presen d to the Committee and included in th official record of the proceedings.

Anyone who wishes to mal an oral presentation should notify the Division of Consumer Affairs before th meeting date. The request should incl e the amount of time desired, the ca acity in which the person will appear d a brief outline of the content of the presentation. Oral presentatic s will be scheduled at the discretion of e chairman of the Committee to e extent which time permits.

For additional information ntact:

Clarence Page, Division of Co sumer Affairs, Occupational Safet and Health Administration, 3rd reet and Constitution Avenue, N.W., m. N3635, Washin ton, D.C. 20 0. Telephone 202/523–8024.

Official records of the meet gs will be available for public inspec on at the Division of Consumer Affairs.

Signed at Washington, D.C., this 16th day of January 1981.

Eula Bingham,

Assistant Secretary of Labor.

[FR Doc. 81–[illegible] Filed 1–22–81; 8:45 am]

BILLING CODE 4510-26-M

NUCLEAR REGULATORY COMMISSION

Criteria for Guidance of States and NRC in Discontinuance of NRC Regulatory Authority and Assumption Thereof by States Through Agreement

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Statement of Policy.

SUMMARY: The Nuclear Regulatory Commission has revised its statement of policy regarding criteria for guidance of States and NRC in discontinuance of NRC regulatory authority and assumption of regulatory authority by States through agreement. This action is necessary to make editorial changes to update the policy statement, to allow States to enter into agreements for low-level waste only, and to incorporate the provisions and requirements of the Uranium Mill Tailings Radiation Control Act of 1978. Adoption of this policy will allow interested States to enter into agreements with the NRC and regulate low-level waste sites only. Additionally, those States that meet the criteria for the regulation of uranium mills and tailings may exercise regulatory authority over these sources as provided by the Uranium Mill Tailings Radiation Control Act of 1978, as amended.

The revised statement of policy reflects the following principal changes:

1. Modification of Criterion 27 to allow a State to seek an agreement for the regulation of low-level waste as a separate category.

2. Inclusion of additional criteria for States wishing to continue regulating uranium and thorium processors and mill tailings after November 8, 1981.

3. Editorial and clarifying changes to make the statement current.

DATES: This policy statement is effective January 23, 1981.

FOR FURTHER INFORMATION CONTACT: John F. Kendig, Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone: 301-492-7767.

SUPPLEMENTARY INFORMATION:

1. These criteria were developed to implement a program, authorized by Pub. L. 86–373 which was enacted in the form of a new section to the Atomic Energy Act (Section 274) and approved by the President on September 23, 1959 and amended by Pub. L. 95–604 approved November 8, 1978. These criteria are intended to indicate factors which the Commission intends to consider in approving new or amended agreements. They are not intended to limit Commission discretion in viewing individual agreements or amendments. In accordance with these statutory provisions, when an agreement between a State and the NRC is effected, the Commission will discontinue its regulatory authority within that State over one or more of the following materials: byproduct material as defined in Section 11e(1) of the Act (radioisotopes), byproduct material as defined in Section 11e(2) of the Act (mill tailings or wastes), source material (uranium and thorium), special nuclear material (uranium 233, uranium 235 and plutonium) in quantities not sufficient to form a critical mass and permanent disposal of low-level waste containing one or more of the materials stated above but not including mill tailings.

2. An agreement may be effected between a State and NRC: (1) upon certification by the Governor that the State has a program for the control of radiation hazards adequate to protect the public health and safety with respect to the materials within the State covered by the proposed agreement and the State desires to assume regulatory responsibility for such materials; and (2) after a finding by the Commission that the State program is in accordance with the requirements of subsection o of section 274 and in all other respects compatible with the Commission's program for the regulation of such materials, and is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement. It is also necessary that the State have enabling legislation authorizing its Governor to enter into such an agreement.

3. The original criteria were published on March 24, 1961 (26 FR 2537) after discussions with various State officials and other State representatives, to provide guidance and assistance to the States and the AEC (now NRC) in developing a regulatory program which would be compatible with that of the NRC. The criteria were circulated among States, Federal agencies, labor and industry, and other interested groups for comment.

4. The criteria require that the State authority consider the total accumulated occupational radiation exposure of individuals. To facilitate such an appoach, it is the view of the NRC that an overall radiation protection program is desirable. The maximum scope of

each State's radiation protection program is not, however, a necessary or appropriate subject for coverage in the criteria. Consequently, the criteria are silent on the question of whether a State should have a total regulatory program covering all sources of radiation, including those not subject to control by the NRC under the Atomic Energy Act, such as x-rays, radium, accelerators, etc.

5. These revised criteria provide for entering into an agreement for a separate category of materials, namely, low-level waste material in permanent disposal facilities. They also provide new criteria for States wishing to continue regulating uranium and thorium processing and the wastes resulting therefrom under the provisions of the Uranium Mill Tailings Radiation Control Act of 1978 (Pub. L. 95–604) after November 8, 1981. The revised criteria also contain a number of editorial changes such as changing AEC to NRC where appropriate to conform to present practice and law.

6. Inquiries about details of the criteria or other aspects of the NRC Federal-State Relations Program should be addressed to the Office of State Programs, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

Criteria [1]

Objectives

1. *Protection.* A State regulatory program shall be designed to protect the health and safety of the people against radiation hazards.

Radiation Protection Standards [2]

2. *Standards.* The State regulatory program shall adopt a set of standards for protection against radiation, which shall apply to byproduct, source and special nuclear materials in quantities not sufficient to form a critical mass.

3. *Uniformity in Radiation Standards.* It is important to strive for uniformity in technical definitions and terminology, particularly as related to such things as units of measurement and radiation dose. There shall be uniformity on maximum permissible doses and levels of radiation and concentrations of radioactivity, as fixed by Part 20 of the NRC regulations based on officially approved radiation protection guides.

4. *Total Occupational Radiation Exposure.* The regulatory authority shall consider the total occupational radiation exposure of individuals, including that from sources which are not regulated by it.

5. *Surveys, Monitoring.* Appropriate surveys and personnel monitoring under the close supervision of technically competent people are essential in achieving radiological protection and shall be made in determining compliance with safety regulations.

6. *Labels, Signs, Symbols.* It is desirable to achieve uniformity in labels, signs and symbols, and the posting thereof. However, it is essential that there be uniformity in labels, signs, and symbols affixed to radioactive products which are transferred from person to person.

7. *Instruction.* Persons working in or frequenting restricted areas [3] shall be instructed with respect to the health risks associated with exposure to radioactive materials and in precautions to minimize exposure. Workers shall have the right to request regulatory authority inspections as per 10 CFR 19, section 19.16 and to be represented during inspections as specified in section 19.14 of 10 CFR 19.

8. *Storage.* Licensed radioactive material in storage shall be secured against unauthorized removal.

9. *Waste Disposal.* The standards for the disposal of radioactive materials into the air, water, and sewers, and burial in the soil shall be in accordance with Part 20. Holders of radioactive material desiring to release or dispose of quantities in excess of the prescribed limits shall be required to obtain special permission from the appropriate regulatory authority.

10. *Regulatic‥s Governing Shipment of Radioactive Materials.* The State shall to the extent of its jurisdiction promulgate regulations applicable to the shipment of radioactive materials, such regulations to be compatible with those established by the U.S. Department of Transportation and other agencies of the United States whose jurisdiction over interstate shipment of such materials necessarily continues. State regulations regarding transportation of radioactive materials must be compatible with 10 CFR Part 71.

11. *Records and Reports.* The State regulatory program shall require that holders and users of radioactive materials (a) maintain records covering personnel radiation exposures, radiation
surveys, and disposals of mate   als; (b)
keep records of the receipt anc   ransfer
of the materials; (c) report sign   icant
incidents involving the materia   s, as
prescribed by the regulatory a   hority;
(d) make available upon reque   of a
former employee a report of th
employee's exposure to radiati   n; (e) at
request of an employee advise   e
employee of his or her annual   diation
exposure; and (f) inform each   nployee
in writing when the employee   s
received radiation exposure in   xcess of
the prescribed limits.

12. *Additional Requirements   nd*
Exemptions. Consistent with t   overall
criteria here enumerated and t
accommodate special cases or
circumstances, the State regul   ory
authority shall be authorized i
individual cases to impose ad   ional
requirements to protect health   nd
safety, or to grant necessary e   mptions
which will not jeopardize heal   and
safety.

Prior Evaluation of Uses of Ra   ioactive Materials

13. *Prior Evaluation of Haz   ds and*
Uses, Exceptions. In the prese   state of
knowledge, it is necessary in r   gulating
the possession and use of byp   duct,
source and special nuclear ma   rials
that the State regulatory auth   ty
require the submission of info   ation
on, and evaluation of, the pot   tial
hazards and the capability of   e user or
possessor prior to his receipt   the
materials. This criterion is sub   ct to
certain exceptions and to con   uing
reappraisal as knowledge anc
experience in the atomic ener   field
increase. Frequently there are   and
increasingly in the future ther   may be,
categories of materials and us   as to
which there is sufficient know   dge to
permit possession and use wi   out prior
evaluation of the hazards and   e
capability of the possessor an   user.
These categories fall into two   roups—
those materials and uses whi   may be
completely exempt from regul   ory
controls, and those materials   d uses
in which sanctions for misuse   re
maintained without pre-evalu   ion of
the individual possession or u   s. In
authorizing research and deve   opment
or other activities involving m   tiple
uses of radioactive materials,   here an
institution has people with ex   nsive
training and experience, the S   te
regulatory authority may wish   o
provide a means for authorizi   broad
use of materials without eval   ting each
specific use.

14. *Evaluation Criteria.* In e   aluating
a proposal to use radioactive   aterials,
the regulatory authority shall   etermine
the adequacy of the applicant   facilities

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[1] The criteria were first adopted in February 1961 (26 FR 2537, March 24, 1961, and amended in November 1965 (30 FR 15044, December 4, 1965). Minor editorial changes were made in June 1968 to reflect the authority of the U.S. Department of Transportation and Organization change in NCRP.

[2] Suggested State regulations and State legislation will give content to all criteria enunciated.

[3] "Restricted area" means any area access to which is controlled by the licensee for the purpose of radiation protection of individuals from exposure to radiation and radioactive materials. "Restricted area" shall not include any area used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

and safety equipment, his training and experience in the use of the materials for the purpose requested, and his proposed administrative controls. States should develop guidance documents for use by license applicants. this guidance should be consistent with NRC licensing and regulatory guides for various categories of licensed activities.

15. *Human Use.* The use of radioactive materials and radiation on or in humans shall not be permitted except by properly qualified persons (normally licensed physicians) possessing prescribed minimum experience in the use of radioisotopes or radiation.

Inspection

16. *Purpose, Frequency.* The possession and use of radioactive materials shall be subject to inspection by the regulatory authority and shall be subject to the performance of tests, as required by the regulatory authority. Inspection and testing is conducted to determine, and to assist in obtaining, compliance with regulatory requirements.

Freqency of inspection shall be related directly to the amount and kind of material and type of operation licensed, and it shall be adequate to insure compliance.

17. *Inspections Compulsory.* Licensees shall be under obligation by law to provide access to inspectors.

18. *Notification of Results of Inspection.* Licensees are entitled to be advised of the results of inspections and to notice as to whether or not they are in compliance.

Enforcement

19. *Enforcement.* Possession and use of radioactive materials should be amenable to enforcement through legal sanctions, and the regulatory authority shall be equipped or assisted by law with the necessary powers for prompt enforcement. This may include, as appropriate, administrative remedies looking toward issuance of orders requiring affirmative action or suspension or revocation of the right to possess and use materials, and the impounding of materials, the obtaining of injunctive relief, and the imposing of civil or criminal penalties.

Personnel

20. *Qualifications of Regulatory and Inspection Personnel.* The regulatory agency shall be staffed with sufficient trained personnel. Prior evaluation of applications for licenses or authorizations and inspection of licensees must be conducted by persons possessing the training and experience relevant to the type and level of radioactivity in the proposed use to be evaluated and inspected. This requires competency to evaluate various potential radiological hazards associated with the many uses of radioactive material and includes concentrations of radioactive materials in air and water, conditions of shielding, the making of radiation measurements, knowledge of radiation instruments—their selection, use and calibration—laboratory design, contamination control, other general principles and practices of radiation protection, and use of management controls in assuring adherence to safety procedures. In order to evaluate some complex cases, the State regulatory staff may need to be supplemented by consultants or other State agencies with expertise in geology, hydrology, water quality, radiobiology and engineering disciplines.

To perform the functions involved in evaluation and inspection, it is desirable that there be personnel educated and trained in the physical and/or life sciences, including biology, chemistry, physics and engineering, and that the personnel have had training and experience in radiation protection. For example, the person who will be responsible for the actual performance of evaluation and inspection of all of the various uses of byproduct, source and special nuclear material which might come to the regulatory body should have substantial training and extensive experience in the field of radiation protection. It is desirable that such a person have a bachelor's degree or equivalent in the physical or life sciences, and specific training-radiation protection.

It is recognized that there will also be persons in the program performing a more limited function in evaluation and inspection. These persons will perform the day-to-day work of the regulatory program and deal with both routine situations as well as some which will be out of the ordinary. These persons should have a bachelor's degree or equivalent in the physical or life sciences, training in health physics, and approximately two years of actual work experience in the field of radiation protection.

The foregoing are considered desirable qualifications for the staff who will be responsible for the actual performance of evaluation and inspection. In addition, there will probably be trainees associated with the regulatory program who will have an academic background in the physical or life sciences as well as varying amounts of specific training in radiation protection but little or no actual work experience in this field. The background and specific training of these persons will indicate to some extent their potential role in the regulatory program. These trainees, of course, could be used initially to evaluate and inspect those applications of radioactive materials which are considered routine or more standardized from the radiation safety standpoint, for example, inspection of industrial gauges, small research programs, and diagnostic medical programs. As they gain experience and competence in the field, trainees could be used progressively to deal with the more complex or difficult types of radioactive material applications. It is desirable that such trainees have a bachelor's degree or equivalent in the physical or life sciences and specific training in radiation protection. In determining the requirements for academic training of individuals in all of the foregoing categories proper consideration should be given to equivalent competency which has been gained by appropriate technical and radiation protection experience.

It is recognized that radioactive materials and their uses are so varied that the evaluation and inspection functions will require skills and experience in the different disciplines which will not always reside in one person. The regulatory authority should have the composite of such skills either in its employ or at its command, not only for routine functions, but also for emergency cases.

Special Nuclear Material, Source Material and Tritium

21. *Conditions Applicable to Special Nuclear Material, Source Material and Tritium.* Nothing in the State's regulatory program shall interfere with the duties imposed on the holder of the materials by the NRC, for example, the duty to report to the NRC, on NRC prescribed forms (1) transfers of special nuclear material, source material and tritium, and (2) periodic inventory data.

22. *Special Nuclear Material Defined.* Special nuclear material in quantities not sufficient to form a critical mass, for present purposes means uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; uranium 233 in quantities not exceeding 200 grams; plutonium in quantities not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of

such ratios for all of the kinds of special nuclear material in combination should not exceed "1" (i.e., unity). For example, the following quantities in combination would not exceed the limitation and are within the formula, as follows:

$$\frac{175\ (\text{grams contained U-235})}{350} + \frac{50\ (\text{grams U-233})}{200} + \frac{50\ (\text{grams Pu})}{200} = 1$$

(This definition is subject to change by future Commission rule or regulation.)

Administration

23. State practices for assuring the fair and impartial administration of regulatory law, including provision for public participation where appropriate, should be incorporated in procedures for:

a. Formulation of rules of general applicability;

b. Approving or denying applications for licenses or authorization to possess and use radioactive materials, and

c. Taking disciplinary actions against licensees.

Arrangements For Discontinuing NRC Jurisdiction

24. *State Agency Designation.* The State should indicate which agency or agencies will have authority for carrying on the program and should provide the NRC with a summary of that legal authority. There should be assurances against duplicate regulation and licensing by State and local authorities, and it may be desirable that there be a single or central regulatory authority.

25. *Existing NRC Licenses and Pending Applications.* In effecting the discontinuance of jurisdiction, appropriate arrangements will be made by NRC and the State to ensure that there will be no interference with or interruption of licensed activities or the processing of license applications, by reason of the transfer. For example, one approach might be that the State, in assuming jurisdiction, could recognize and continue in effect, for an appropriate period of time under State law, existing NRC licenses, including licenses for which timely applications for renewal have been filed, except where good cause warrants the earlier reexamination or termination of the license.

26. *Relations With Federal Government and Other States.* There should be an interchange of Federal and State information and assistance in connection with the issuance of regulations and licenses or authorizations, inspection of licensees, reporting of incidents and violations, and training and education problems.

27. *Coverage, Amendments, Reciprocity.* An agreement providing for discontinuance of NRC regulatory authority and the assumption of regulatory authority by the State may relate to any one or more of the following categories of materials within the State, as contemplated by Public Law 86-373 and Public Law 95-604:

a. Byproduct materials as defined in section 11e(1) of the Act.

b. Byproduct materials as defined in section 11e(2) of the Act.

c. Source materials.

d. Special nuclear materials in quantities not sufficient to form a critical mass.

e. Low-level wastes in permanent disposal facilities, as defined by statute or Commission rules or regulations containing one or more of the materials stated in a, c, and d above but not including byproduct material as defined in Section 11e(2) of the Act;

but must relate to the whole of such category or categories and not to a part of any category.[4] If less than the five categories are included in any discontinuance of jurisdiction, discontinuance of NRC regulatory authority and the assumption of regulatory authority by the State of the others may be accomplished subsequently by an amendment or by a later agreement.

The agreement may incorporate by reference provisions of other documents, including these criteria, and the agreement shall be deemed to incorporate without specific reference the provisions of Pub. L. 86-373 and Pub. L. 95-604 and the related provisions of the Atomic Energy Act.

Arrangements should be made for the reciprocal recognition of State licenses and Federal licenses in connection with out-of-the-jurisdiction operations by a State or Federal licensee.

28. *NRC and Department of Energy Contractors.* The State should provide exemptions for NRC and DOE contractors which are substantially equivalent to the following exemptions:

a. Prime contractors performing work

for the
or con
b. P
resear
manuf
transp
compc
c. Pr
nuclea
device
vehicl
d. A
subco
State
that, u
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[4] A State which does not wish to continue regulation of uranium and thorium processors and byproduct material, as defined in Section 11e.(2) of the Atomic Energy Act as amended, after November 8, 1981 pursuant to Pub. L. 95-604 may obtain authority over all source material licenses within the State except for uranium or thorium processors.

are not to be transferred to the Federal Government. The funds collected by the State shall be sufficient to ensure compliance with the regulations the Commission establishes pursuant to Section 161X of the Atomic Energy Act.

d. In the issuances of licenses, an opportunity for written comments, public hearing (with transcript) and cross examination is required.

e. In the issuances of licenses, a written determination of the action to be taken based upon evidence presented during the public comment period and which is subject to judicial review is required.

f. A ban on major construction prior to completion of the aforementioned stipulations.

g. An opportunity shall be provided for public participation through written comments, public hearings, and judicial review of rules.

30. In the enactment of any supporting legislation, the State should take into account the reservations of authority to the U.S. in UMTRCA as stated in 10 CFR 150.15a and summarized by the following:

a. The establishment of minimum standards governing reclamation, long-term surveillance or maintenance, and ownership of the byproduct material.

b. The determination that prior to the termination of a license, the licensee has complied with decontamination, decommissioning and reclamation standards, and ownership requirements for sites at which byproduct material is present.

c. The requirement that prior to termination of any license for byproduct material, as defined in Section 11e.(2), of the Atomic Energy Act or for any activity that results in the production of such material, title to such byproduct material and the disposal site be transferred to the Federal Government or State at the option of the State, provided such option is exercised prior to termination of the license.

d. The authority to require such monitoring, maintenance, and emergency measures after the license is terminated as necessary to protect the public health and safety for those materials and property for which the State has assumed custody pursuant to Pub. L. 95–604.

e. The authority to permit use of the surface or subsurface estate, or both of the land transferred to the United States or State pursuant under provision of the Uranium Mill Radiation Tailings Control Act.

f. The authority to exempt land ownership transfer requirements of Section 83(b)(1)(A).

31. It is preferable that State statutes contain the provisions of Section 6 of the Model Act. But the following may be accomplished by adoption of either procedures by regulation or technical criteria. In any case, authority for their implementation should be adequately supported by statute, regulation or case law as determined by the State Attorney General.

In the licensing and regulation of ores processed primarily for their source material content and for the disposal of byproduct material, procedures shall be established which provide a written analysis of the impact on the environment of the licensing activity. This analysis shall be available to the public before commencement of hearings and shall include:[4]

a. An assessment of the radiological and nonradiological public health impacts;

b. An assessment of any impact on any body of water or groundwater;

c. Consideration of alternatives to the licensed activities; and

d. Consideration of long-term impacts of licensed activities (see Item 36b.(1).

Regulations

32. State regulations should be reviewed for regulatory requirements, and where necessary incorporate regulatory language which is equivalent to the extent practicable or more stringent than regulations and standards adopted and enforced by the Commission, as required by Section 274o (see 10 CFR 40 and 10 CFR 150.31(b)).

Organizational Relationships Within the States

33. Organizational relationships should be established which will provide for an effective regulatory program for uranium mills and mill tailings.

a. Charts should be developed which show the management organization and lines of authority. This chart should define the specific lines of supervision from program management within the radiation control group and any other department within the State responsible for contributing to the regulation of uranium processing and disposal of tailings. When other State agencies or regional offices are utilized, the lines of communication and administrative control between the agencies and/or regions and the Program Director should be clearly drawn.

b. Those States that will utilize personnel from other State Departments or Federal agencies in preparing the environmental assessment should designate a lead agency for supervising and coordinating preparation of this environmental assessment. It is normally expected that the radiation control agency in Agreement States will be the lead agency. The basic premise is that the lead agency is required to prepare the environmental assessment. Utilization of an applicant's environmental report in lieu of a lead agency assessment of the proposed project is not adequate or appropriate. However, the lead agency may prepare an environmental assessment based upon an applicant's environmental report. Other credible information may be utilized by the State as long as such information is verified and documented by the State.

c. When a lead agency is designated, that agency should coordinate preparation of the statement. The other agencies involved should provide assistance with respect to their areas of jurisdiction and expertise. Factors relevant in obtaining assistance from other agencies include the applicable statutory authority, the time sequence in which the agencies become involved, the magnitude of their involvement, and relative expertise with respect to the project's environmental effects.

In order to bring an environmental assessment to a satisfactory conclusion, it is highly recommended that an initial scoping document be developed which clearly delineates the area and scope of work to be performed by each agency, within a given time constraint.

d. For those areas in the environmental assessment where the State cannot identify a State agency having sufficient expertise to adequately evaluate the proposal or prepare an assessment, the State should have provisions for obtaining outside consulting services. In those instances where non-governmental consultants are utilized, procedures should be established to avoid conflict of interest consistent with State law and administrative procedures.

Medical consultants recognized for their expertise in emergency medical matters, such as the Oak Ridge and Hanford National Laboratories, relating to the intake or uranium and its diagnosis thereof associated with uranium mining and milling should be identified and available to the State for advice and direct assistance.

During the budget preparation, the State should allow for funding costs incurred by the use of consultants. In addition, consultants should be available for any emergencies which

may occur and for which their expertise would be needed immediately.

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[4] It is strongly recommended that a 30-day period be provided for public review.

Personnel

34. Personnel needed in the processing of the license application can be identified or grouped according to the following skills: Technical; Administrative; and Support.

a. Administrative personnel are those persons who will provide internal guides, policy memoranda, reviews and managerial services necessary to assure completion of the licensing action. Support personnel are those persons who provide secretarial, clerical support, legal, and laboratory services. Technical personnel are those individuals who have the training and experience in radiation protection necessary to evaluate the engineering and radiological safety aspects of a uranium concentrator. Current indications are that 2 to 2.75 total professional person years' effort is needed to process a new conventional mill license, in situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years effort for support and legal services should be one secretary for approximately 2 conventional mills and ½ staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory support services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activitives of UMTRCA.

b. In evaluating license applications the State shall have access to necessary specialities, e.g., radiological safety, hydrology, geology and dam construction and operation.

In addition to the personnel qualifications listed in the "Guide for Evaluation of State Radiation Control Programs," Revision 3, February 1, 1980, the regulatory staff involved in the regulatory process (Radiation) should have additional training in Uranium Mill Health Physics and Environmental Assessments.

c. Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers.

Functions To Be Covered

35. The States should develop procedures for licensing, inspection, and preparation of environmental assessments.

a. *Licensing*

(1) Licensing evaluations or assessments should include in-plant radiological safety aspects in occupational or restricted areas and environmental impacts to populations in unrestricted areas from the plant.

(2) It is expected that the State will review, evaluate and provide documentation of these evaluations. Items which should be evaluated are:

(a) Proposed activities;

(b) Scope of proposed action;

(c) Specific activities to be conducted;

(d) Administrative procedures;

(e) Facility organization and radiological safety responsibilities, authorities, and personnel qualifications;

(f) Licensee audits and inspections;

(g) Radiation safety training programs for workers;

(h) Radiation safety program, control and monitoring;

(i) Restricted area markings and access control;

(j) At existing mills, review of monitoring data, exposure records, licensee audit and inspection records, and other records applicable to existing mills;

(k) Environmental monitoring;

(l) Emergency procedures, radiological;

(m) Product transportation; and

(n) Site and physical decommissioning procedures, other than tailings.

(o) Employee exposure data and bioassay programs.

b. *Environmental Assessment*

(1) The environmental evaluation should consist of a detailed and documented evaluation of the following items:

(a) Topography;

(b) Geology;

(c) Hydrology and water quality;

(d) Meteorology;

(e) Background radiation;

(f) Tailings retention system;

(g) Interim stabilization, reclamation, and Site Decommissioning Program;

(h) Radiological Dose Assessment;

(1) Source terms

(2) Exposure pathway

(3) Dose commitment to individuals

(4) Dose commitment to populations

(5) Evaluation of radiological impacts to the public to include a determination of compliance with State and Federal regulations and comparisons with background values

(6) Occupational dose

(7) Radiological impact to biota other than man

(8) Radiological monitoring programs, pre-occupational and operational

(i) Impacts to surface and groundwater, both quality and quantity;

(j) Environmental effects of accidents; and

(k) Evaluation of tailings management alternatives in terms of regulations.

(2) The States are encouraged to examine the need to expand the scope of the assessment into other areas such as:

(a) Ecology;

(b) Environmental effects of site preparation and facility construction on environment and biota;

(c) Environmental effects of use and discharge of chemicals and fuels; and

(d) Economic and social effects.

c. *Inspections*

(1) As a minimum, items which should be inspected or included during the inspection of a uranium mill should adhere to the items evaluated in the in-plant safety review. The principal items recommended for inspection are:

(a) Administration;

(b) Mill circuit, including any additions, deletions, or circuit changes;

(c) Accidents/Incidents;

(d) Part 19 or equivalent requirements of the State;

(e) Action taken on previous findings;

(f) A mill tour to determine compliance with regulations, and license conditions;

(g) Tailings waste management in accordance with regulations and license conditions (see NRC Reg. Guide 3.11.1);

(h) Records;

(i) Respiratory protection in accordance with license conditions or 10 CFR Part 20.

(j) Effluent and environmental monitoring;

(k) Training programs;

(l) Transportation and shipping;

(m) Internal review and audit by management;

(n) Exit interview; and

(o) Final written report documenting the results of the inspection and findings on each item.

(2) In addition, the inspector should perform the following:

(a) Independent surveys and sampling.

(3) Additional guidance is contained in appropriate NRC regulatory and inspection guides. A *complete* inspection should be performed at least once per year.

d. *Operational Data Review*

(1) In addition to the reporting requirements required by the regulations or license conditions, the licensee will submit in writing to the regulatory agency within 60 days after January 1 and July 1 of each year, reports specifying the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous six months of operation. This data shall be reported in a manner that will permit the regulatory agency to confirm the potential annual radiation doses to the public.

(2) All data from the radiological and non-radiological environmental monitoring program will alsr be submitted for the same time periods and frequency. The data will be reported in a manner that will allow the regulatory agency to conform the dose to receptors.

Instrumentation

36. The State should have available both field and laboratory instrumentation sufficient to ensure the licensee's control of materials and to validate the licensee's measurements.

a. The State will submit its list of instrumentation to the NRC for review. Arrangements should be made for calibrating such equipment.

b. Laboratory-type instrumentation should be available in a State agency or through a commercial service which has the capability for quantitative and qualitative analysis of radionuclides associated with natural uranium and its decay chain, primarily: U-238, Ra-226, Th-320, Pb-210, and Rn-222, in a variety of sample media such as will be encountered from an environmental sampling program.

Analysis and data reduction from laboratory analytical facilities should be available to the licensing and inspection authorities in a timely manner. Normally, the data should be available within 30 days of submittal. State acceptability of quality assurance (QA) programs should also be established for the analytical laboratories.

c. Arrangements should also be completed so that a large number of samples in a variety of sample media resulting from a major accident can be analyzed in a time frame that will allow timely decisions to be made regarding public health and safety.

d. Arrangements should be made to participate in the Environmental Protection Agency quality assurance program for laboratory performance.

Dated at Washington, D.C. this 16th day of January, 1981.

For the Nuclear Regulatory Commission.

John C. Hoyle,

Assistant Secretary of the Commission.

[FR Doc. 81-[illegible] Filed 1-22-81; 8:45 am]

BILLING CODE 7590-01-M

Advisory Committee on Reactor Safeguards; Proposed Meetings

In order to provide advance information regarding proposed meetings of the ACRS Subcommittees and Working Groups, and of the full Committee, the following preliminary schedule reflects the current situation, taking into account additional meetings which have been scheduled and meetings which have been postponed or cancelled since the last list of proposed meetings published Dec. 22, 1980 (45 FR 84182). Those meetings which are definitely scheduled have had, or will have, an individual notice published in the Federal Register approximately 15 days (or more) prior to the meeting. Those Subcommittee and Working Group meetings for which it is anticipated that there will be a portion or all of the meeting open to the public are indicated by an asterisk (*). It is expected that the sessions of the full Committee meeting designated by an asterisk (*) will be open in whole or in part to the public. ACRS full Committee meetings begin at 8:30 a.m. and Subcommittee and Working Group meetings usually begin at 8:30 a.m. The time when items listed on the agenda will be discussed during full Committee meetings and when Subcommittee and Working Group meetings will start will be published prior to each meeting. Information as to whether a meeting has been firmly scheduled, cancelled, or rescheduled, or whether changes have been made in the agenda for the February 1981 ACRS full Committee meeting can be obtained by a prepaid telephone call to the Office of the Executive Director of the Committee (telephone 202/634-3267, ATTN: Mary E. Vanderholt) between 8:15 a.m. and 5:00 p.m., Easter Time.

ACRS Subcommittee Meetings

**Fort St. Vrain.* January 27, 1981, at site, near Longmont, CO. The Subcommittee will review operating experience, degree of success in eliminating the core power fluctuations, core performance (fuel and structural), plans for testing and operation at levels above 70% of rated power and plans for future operations, modifications, refueling, and shift manning requirments. Notice of this meeting was published Jan. 12.

**Safety Philosphy, Technology and Criteria.* January 28, 1981, Los Angeles, CA. The Subcommittee will discuss requirements for new (beyond Near-Term Construction Permit) reactor plants. Notice of this meeting was published Jan. 14.

**Extreme External Phenomena.* January 29–30, 1981, Los Angeles, CA. The Subcommittee will discuss the status of the Seismic Safety Margins Program. Notice of this meeting was published Jan. 14.

**San Onofre 2 and 3.* January 31, 1981, Los Angeles, CA. The Subcommittee will meet to review the seismology and geology related items for San Onofre Units 2 and 3 for an Operating License. Notice of this meeting was published Jan. 15.

**Regulatory Activities.* February 3, 1981, Washington, DC. The Subcommittee will discuss proposed Regulatory Guides and Regulations. Notice of this meeting was published Jan. 19.

**Plant Features Important to Safety.* February 3, 1981, Washington, DC. The Subcommittee will discuss the NRC definitions of the terms "safety grade", "safety related" and "important to safety" as developed for testimony related to the Three Mile Island Unit 1 restart, as well as review the generic implications of the use of these definitions in the licensing process. Notice of this meeting was published Jan. 19.

**NRC Safety Research Program.* February 4, 1981, Washington, DC. The Subcommittee will discuss NRC's long-range safety research plan and ACRS comments on the Office of Nuclear Regulatory Research response to ACRS recommendations in NUREG–0699. Notice of this meeting was published Jan. 21.

**Safety Philosophy, Technology and Criteria.* February 4, 1981, Washington, DC. The Subcommittee will discuss the proposed Near-Term Construction Permit. Notice of this meeting was published Jan. 21.

**Reactor Radiological Effects.* February 5, 1981, (1:00 p.m.), Washington, DC. The Subcommittee is to review and comment on the NRC Staff's paper to the NRC Commissioners on the current status of thinking and

EXHIBIT A: ENCLOSURE 2

NEW MEXICO

Regulations

The New Mexico regulations do not cover all of the points in Appendix A, to 10 CFR 40 and 150.31(b) (which constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal under Atomic Energy Act (AEA) Sec. 274.o(2), as amended). While there are some limited technical requirements in the State regulations, (for example, §§ 3-300 K and L and Part 12), 10 CFR 40 Appendix A, Introduction, and Criteria 1-9 and 12 are not covered. Long-term funding (Criterion 10) and land ownership transfer requirements (Criterion 11) are addressed in the regulations; comments on these sections of the New Mexico regulations are provided in later parts of this enclosure.

Also, with regard to regulation development, the State must develop a program for implementation of U. S. EPA fuel cycle radiation protection standards (40 CFR 190) at mills in addition to regulations to be developed under Section 274.o(2).

In connection with developing regulations, the State should recognize that Uranium Mill Tailings Radiation Control Act of 1978, as amended (UMTRCA) states that duplication of proceedings conducted by the Commission is not necessary (last sentence of 274.o of AEA). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law.

It is also noted that UMTRCA requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable, or more stringent than Commission regulations on uranium milling (10 CFR 150.31(b)(2)). The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS* which addressed operations in both Agreement and Non-Agreement States. The Commission regulations constitute minimum national standards.

Immediate Action at Existing Mills

A letter from NRC Chairman Ahearne to Governor King dated June 12, 1980, noted there is need to take prompt action to upgrade tailings management practices at existing uranium mills. While the full upgrading of New Mexico's regulatory program, including issuance of the regulations discussed above, is not required until November of 1981, the State must meet upgraded requirements of the UMTRCA to the maximum extent practicable, in the interim as required by UMTRCA, Section 204(h)(1). During the interim period (before November 1981) 10 CFR 150.31(a) requires Agreement States to implement NRC regulations to the maximum extent practicable as stated in the FR Notice issuing the regulations (see 45 FR 65530). The Commission considers it practicable and necessary for Agreement States' mill operators:

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*GEIS - Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706).

(a) to begin now (as opposed to after November 1981) to develop programs meeting the regulations;

(b) to submit such programs to the Agreement States on the same schedule as non-Agreement State operations;

(c) and to immediately implement steps to deal with presently occurring impacts such as blowing of tailings and uncontrolled seepage.

The need to take prompt action at existing mills has been raised in correspondence numerous times by the NRC staff over the past several years. As a result of conversations with the NMEID staff and our examination of materials in State files during the periodic review of the State's program, it cannot be explicitly determined if NMEID has taken documented steps to require existing mill operators to develop specific tailings management programs.

Long-Term Surveillance and Monitoring

We recognize that New Mexico legislation and regulations contain provisions for a Continued Care Fund"...for use in remedying and preventing situations which may be harmful to the health, safety, welfare or property of the people, involving abandoned wastes or inoperative facilities which are or were operated by depositors to the continued care fund." It is our understanding that this is a fund which will also cover the costs associated with long-term monitoring.

It appears that the total amount of each operator's deposit to the fund is more than sufficient at the present time to satisfy the escalating fee requirement established by the NRC in Criterion 10 of NRC regulations. However, in view of the differing structures of the Federal and State long-term monitoring fund there is the possibility that at some time in the future the fixed amount specified in the New Mexico Regulation ($1,000,000) may no longer be sufficient.

Existing New Mexico legislation or regulations nowhere require efforts to eliminate the need for active, ongoing maintenance of sites over the long term. This is a fundamental requirement of 10 CFR 40, App. A Criteria 1 and 12 and is consistent with Sec. 161.x.(2) (A) of AEA as amended. While there may be some uncertainty over the degree of ongoing surveillance that will be needed over the long-term, the clear thrust of legislation and regulations must be to require elimination of active maintenance (see also 12.3.11 and 14.3 of NUREG-0706.) This concept should be stated explicitly in State regulations so that the existence of a "Continued Care" fund does not encourage programs which need ongoing active maintenance.

Reservations of Authority to the NRC

With regard to land ownership, the State regulations appear to have adequate provisions for requiring the licensee to obtain title to disposal sites for eventual transfer to the State or Federal government. Section 3-300 J(2), however, contains reservations of authority to the State, regarding such transfer. These authorities are reserved to the Commission by section 83(a) of the Atomic Energy Act, as amended. The determination as to whether title transfer to the government is necessary to protect the public health and safety or welfare or to minimize or eliminate danger to life or property can only be made by the Commission.

The final determination that all decommissioning, decontamination and reclamation requirements of the Commission have been met prior to license termination and land transfer is to be made by the Commission (10 CFR 150.15a and Atomic Energy Act, Sec. 83.c). Sections 12-300 E and J appear to conflict with this reserved authority.

In connection with land ownership transfer requirements, it should be noted that the only areas which can be committed to long term government custody are the tailings disposal sites and not areas such as evaporation ponds or areas contaminated from active milling operations. These areas must be decontaminated for unrestricted use. (See Criterion 9 of Appendix A, to 10 CFR 40.) This matter is raised at this time so that it might be clarified in the revision to State regulations which should be done to meet Atomic Energy Act Sec. 274.o.

Written Environmental Impact Assessments

We are aware that New Mexico prepared a written assessment in the recent Gulf case which satisfied the provisions of Section 274.o(3)(C) of the Atomic Energy Act. There appears to be no requirement, however, in State statutes for a written environmental analysis to be prepared by the State. Such assessments should be prepared for all licensing actions having significant impact on the human environment, i.e., new licensing actions, renewals, and major amendments. All aspects of the assessment, required by AEA 274.o(3)(C) (including those conducted by other State agencies, such as the Water Pollution Control Bureau) must be included in the documented analysis.

It is considered necessary that this documented assessment be made available for public review and comment for some reasonable amount of time before proceedings (including hearings) on issuance of the license begin. (10 CFR 150.31(b)(3)(i)(A)).

Organizational Relationships Within States

Although a lead agency has been designated as being primarily responsible for the preparation of the independent assessment and other agencies which will participate in the review are identified, the time sequence in which the other groups become involved is not clear. For example, it appears that both the Water Pollution Control Bureau and the State Engineer have independent regulatory responsibility over certain aspects of an operation. Since neither of these organizations are under the supervision of the Radiation Protection Bureau Chief, coordination of the overall assessment needs to be clarified in accordance with Criterion 33(c).

The New Mexico response dated September 8, 1980, identified the need for outside consulting services in a number of areas. With the exception of the $50,000 appropriation for radionuclide analyses, the New Mexico response of September 8, 1980, does not address funding costs incurred as a result of the use of consultants or how such costs are considered during the process of budget preparation. The response does not reveal if the utilization of these consultants has been approved or budgeted. An estimate of each consultant's time for a particular mill licensing action should be identified. (Criterion 33 a through d).

Staff Resources

Information contained in the State September 8, 1980, response indicates that the staff will rely heavily upon the Water Pollution Control Bureau personnel for experience in hydrology. This does not represent a problem; however, it must be documented that such qualified personnel are available on a routine basis for assisting in preparation of the lead agency's assessment and other licensing activities, that is, in person years the amount of their time which can and will be devoted to uranium recovery licensing and regulation, must be documented (Criterion 34(c)). It is recommended that since these other Bureaus and Departments have their own responsibilities for mill licensing projects, the Radiation Protection Bureau initiate formal written agreements, e.g., Memorandum of Understanding, to solidify the coordination and timing of the lead agency assessment. Such agreements as well as budget documents can be the mechanisms used to demonstrate the commitment of other agency personnel.

EXHIBIT B

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DOCKETED
USNRC
APR 13 1981
Office of the Secretary
Docketing & Service
Branch

U.S. Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D.C. 20555

Re: Kerr-McGee Nuclear, et al. v. NRC
C.A. No. 80-2043 and consolidated cases
(Tenth Circuit)

Gentlemen:

This letter is tendered on behalf of Kerr-McGee Nuclear Corporation, United Nuclear Corporation, and Western Nuclear, Inc., petitioners in the above-referenced proceeding. These petitioners intend to apply to the Court of Appeals for a stay of the Uranium Mill Licensing Requirements, promulgated at 45 Fed. Reg. 65521-38 (Oct. 3, 1980), by April 20. Petitioners' anticipated motion is precipitated by NRC's recent actions to compel Agreement States to adopt NRC's Uranium Mill Licensing Requirements as "minimum national standards."

Federal Rule of Appellate Procedure 18 provides that an application for a stay should "ordinarily be made in the first instance to the agency." In compliance with this provision, petitioners hereby apply to the Commission for a stay of the regulations in question pending judicial review. This application is made without prejudice to petitioners' right to apply to the Court of Appeals for relief in the event that the Commission does not grant the requested stay or in the event that the Commission is unable to respond to the request in a timely fashion.

5 U.S.C. § 705 confers general authority upon federal agencies to stay their actions pending review "when ...justice so requires." Under this standard, a stay is warranted here. The Commission has recently advised Agreement

States that they must incorporate the challenged NRC requirements into their regulatory programs by August 1. If this is not accomplished, the Commission has threatened to revoke the discontinuance agreements conferring regulatory authority on the Agreement States in question.

Under the Atomic Energy Act, as amended by the UMTRC Act, 42 U.S.C. § 2021(o)(2), the Agreement States must determine, among other things, whether federal standards and requirements (such as those at issue here) are valid and are practicable under local conditions. Moreover, Agreement States must afford interested parties a right to participate meaningfully in state rulemaking proceedings for adoption of regulations responding to the new federal provisions. The Agreement States cannot make the required determinations and cannot afford interested parties a right to participate meaningfully within the foreshortened schedule demanded by the Commission. NRC's demands thus unlawfully threaten to deprive petitioners of their substantive and procedural rights.

In addition, it is noteworthy that the NRC regulations are beyond the authority of NRC because they were unlawfully issued in advance of EPA standards. In issuing the regulations, NRC usurped the role Congress explicitly assigned EPA under 42 U.S.C. § 2022. Moreover, NRC's regulations are invalid because they are based upon information not disclosed for pubic comment.

Petitioners are aware that NRC has recently taken the position that it will not stay its regulations absent a showing of irreparable injury and probability of success on the merits. See Memorandum and Order No. CLI-81-4 (March 27, 1981). This position flatly contravenes the language of 5 U.S.C. § 705 which specifies that an agency may stay its actions when "justice so requires." It is also contrary to the numerous cases which authorize courts (much less agencies) to stay administrative action if substantial questions are raised as to the validity of the action in question and a stay is necessary to minimize hardship. E.g., Washington Metropolitan Area Transit Commission v. Holiday Tours, Inc., 539 F.2d 841, 843 (D.C. Cir. 1977). However, even under the rigid standard endorsed by NRC, the requested stay should be granted. Petitioners have demonstrated above that the NRC regulations are invalid. Petitioners will suffer irreparable injury to their right to participate in meaningful hearings before Agreement States and EPA if NRC's regulations are not stayed. In addition, petitioners (who own and operate uranium mills in Agreement States) will sustain heavy expenses and unnecessary disruption to their operations if the stay is not granted. The public interest clearly will not be injured by entry of a stay since existing state regulatory programs will continue adequately to protect the public against alleged hazards posed by uranium milling and uranium tailings. Moreover, the risks posed by uranium milling are de minimis, as admitted by NRC in recent documents such as 46 Fed. Reg. 15154 (March 4, 1981) (narrative explanation for Table S-3) and Radon Releases from Uranium Mining and Milling and their Calculated Health Effects (Nureg 0757).

Accordingly, NRC should stay its regulations pending judicial review. In order to afford Agreement States sufficient time to implement such regulations as are upheld by the Court, the stay should remain in effect until at least six months after the Court of Appeals renders its final decision on the merits.

Respectfully submitted,

Peter J. Nickles
Charles H. Montange

Attorneys for Kerr-McGee
Nuclear Corporation, United
Nuclear Corporation, and
Western Nuclear, Inc.

cc: Stephen F. Eilperin, Esq. (by hand)
Sheldon L. Trubatch, Esq. (by hand)

EXHIBIT C

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

FEB 20 1981

The Honorable Richard D. Lamm
Governor of Colorado
Denver, Colorado 80203

Dear Governor Lamm:

On February 1, 1968, Colorado became an Agreement State under Section 274 of the Atomic Energy Act of 1954. Under the provisions of this Act, Colorado assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Colorado applied for and received a grant of $95,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Dr. Frank Traylor, Executive Director, Colorado Department of Health, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Dr. Traylor and his staff and to identify remaining actions which Colorado must accomplish for a timely amended agreement.

In the summer of 1980, we began an early review of current and potential uranium mill Agreement State programs to provide an early indication of where each State stands in preparing to enter into amended agreements. On July 25, 1980, we wrote to Dr. Traylor and reported our initial assessment of the Colorado program for regulating uranium mills and tailings with respect to the criteria. We have received letters from Mr. Albert J. Hazle, Director, Radiation and Hazardous Wastes Control Division, Department of Health, commenting on the NRC's criteria, but we have received no specific response to our July 25, 1980 letter. With these letters and with information obtained during our regular review of the Colorado radiation control program, we have reassessed the readiness of Colorado for an amended agreement to regulate uranium mills. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). The results of our evaluation are discussed in Enclosure 2 to this letter. I would like to highlight two of the actions still needed:

1. Revisions to Colorado's regulations will be needed to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. In our evaluation of the readiness of Colorado, additional staffing will be needed by Colorado to meet upgraded requirements of UMTRCA. We will give the same weight to resource commitments as is given to statutory and regulatory enactments.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining Colorado's actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by Colorado of the application for amendment.

While, in our opinion, Colorado has taken some initial steps toward compliance with UMTRCA, there is much to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. Wayne Kerr, Director of NRC's Office of State Programs.

Sincerely,

/s/

John F. Ahearne
Chairman

Enclosures:
As Stated

cc: Dr. Traylor, Colorado w/encl.
A. Hazle, Colorado w/encl.

EXHIBIT C: ENCLOSURE 2

ENCLOSURE 2

COLORADO

Regulations - General Comments

The Colorado regulations do not cover all of the points in Appendix A, to 10 CFR 40 and 150.31(b) (which constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal under Atomic Energy Act (AEA) Section 274.o(2), as amended). While there are some limited technical requirements in the State regulations, (for example, §§ R.H. 3.8 and R.H. 3.9), 10 CFR 40 Appendix A, Introduction, and Criteria 1-8 and 11 and 12 are not covered. Financial surety arrangements (Criterion 9) and long-term funding requirements (Criterion 10) are addressed in the State's regulations; comments on these sections of the Colorado regulations are provided in later parts of this enclosure.

Also, with regard to regulation development, the State must develop a program for implementation of U.S. EPA fuel cycle radiation protection standards (40 CFR 190) at mills in addition to regulations to be developed under Section 274.o(2).

In connection with developing regulations, the State should recognize that the Uranium Mill Tailings Radiation Control Act of 1978, as amended, (UMTRCA) states that duplication of proceedings conducted by the Commission is not necessary (last sentence of 274.o of AEA). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law.

It is also noted that UMTRCA requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable or more stringent than Commission regulations on uranium milling (10 CFR 150.31(b)(2)). The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS* which addressed operations in both Agreement and Non-Agreement States. The Commission regulations constitute minimum national standards.

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*GEIS - Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706).

Financial Surety

Section R.H. 3.9.4 of the Colorado regulations appears to contain adequate authority to require mill operators to furnish financial surety arrangements; however, the provisions for exemptions to this requirement (specifically, Section R.H. 3.9.4.1.2.5) are not appropriate. Any uranium recovery operation will require some facility and site cleanup prior to termination of the license. Therefore, as indicated in 10 CFR 40 Appendix A, Criterion 9, each uranium recovery licensee must provide assurances that he will perform such activities. In addition, R.H. 3.9.4.2.2 permits as adequate financial surety a personal bond backed by collateral. This does not appear to provide adequate protection consistent with 10 CFR 40, Appendix A, Criterion 9 (as discussed more fully in NUREG-0706, Final Generic Environmental Impact Statement on Uranium Milling). R.H. 3.9.4.2.5 permits other unidentified means of financial surety. The regulations should clearly indicate that no financial arrangement which constitutes or provides no greater assurance than self-insurance will be acceptable.

Regarding specific arrangements and terms of surety mechanisms, the regulations do not clearly indicate that the State intends to follow the standards established by the Commission as required.

R.H. 3.3.9.4.2 requires that financial surety be provided prior to the issuance of new licenses and prior to amendment or renewal of existing licenses. Under this section it is possible for currently licensed mills to continue in operation for some time (until license renewal or amendment) without financial surety. This is contrary to 10 CFR 40 Appendix A, Criterion 9 which requires financial surety prior to commencement of operations. Operation after November 8, 1981 without financial surety arrangements should not be permitted. Prior to that date the State should require financial surety arrangements to the maximum extent practicable.

Long-Term Surveillance and Monitoring

R.H. 3.9.5 provides that a long-term monitoring and maintenance fund may be required. This is in contrast to 10 CFR 40, Appendix A, Criterion 10 which provides that a minimum charge shall be paid by each mill operator to cover the cost of long-term surveillance prior to the termination of a mill license. No provision corresponding to 10 CFR § 150.32 regarding transfer of long-term monitoring funds to the state or U.S. is found in either the State statutes or regulations. Nor are provisions relating to transfer of tailings disposal land to the State or U.S. as required by 10 CFR 40, Appendix A, Criterion 11, to be found in the State statutes.

It appears that the existing Colorado legislation or regulations nowhere require efforts to eliminate the need for active, ongoing maintenance of sites over the long term. This is a fundamental requirement of 10 CFR 40, Appendix A, Criteria 1 and 12 and is consistent with Section 161.x.(2)(A) of AEC, as amended. While there may be some uncertainty over the degree of ongoing surveillance that will be needed over the long term, the clear thrust of legislation and regulations must be to require elimination of active maintenance (see also 12.3.11 and 14.3 of NUREG-0706). This concept should be stated explicitly in State regulations so that the existence of a "Long-Term Care" fund does not encourage programs which need ongoing active maintenance. (For example, this would include amending R.H. 3.9.5, which provides for the collection of monies to cover long-term maintenance, to make it clear that no active maintenance can be necessary over the long term to preserve isolation.)

Section R.H. 3.9.5.3 of Colorado's regulations conflict with Section 83(b)(2) of the Atomic Energy Act, as amended, and 10 CFR 150.15a(b)(5) which reserve to the Commission authority to make determinations concerning the necessary level of long-term monitoring and surveillance.

Written Environmental Assessments

Colorado regulations contain no requirement for a written environmental analysis to be prepared by the State, as required by Section 274o(3)(C) of the Atomic Energy Act, as amended. We recognize, through our involvement in providing technical assistance to the State, that Colorado has prepared such assessments in connection with several recent licensing cases; however, the requirements must be an explicity programmatic requirement. Such assessments should be prepared for all licensing actions having significant impact on the human environment, i.e., new licensing actions, renewals, and major amendments. All aspects of the assessment, required by AEA 274.o(3)(c) (including those conducted by other State agencies), must be included in the documented analysis.

Further, procedures should be provided which assure that this documented assessment will be made available for public review and comment for some reasonable amount of time before proceedings (including hearings) on issuance of the license begin, 10 CFR 150.31(b)(3)(i)(A)).

NOTE: In Section R.H. 3.9.4.1.2.5, specific emphasis appears to be placed on radiological impacts. In order to comply with Section 274o(3)(C)(i) of the AEA, as amended, equal emphasis, throughout the mill program, should be placed on non-radiological impacts.

Pre-Licensing Construction

Colorado regulations, Section RH 3.8.7, provides for a ban on prelicensing construction, unless an exemption is granted by the Department. The factors to be considered in granting exemptions from the construction ban appear to be subject to extremely liberal interpretation. It should be noted that 10 CFR § 150.31(b)(3)(iv) provides for no such exemptions.

Staff Resources and Organizational Relationships

Although the lines of communication and administrative control between organizations within the Department of Health appear to be clearly drawn, the relationship between other State organizations which review environmental reports for uranium mills including: the Department of Natural Resources; the Department of Highways; the Department of Local Affairs; the Colorado Land Use Commission; the Office of the Governor; the Socio-Economic Impact Coordinator's Office; the Office of the State Archeologist; and the State Historical Society, does not appear to be clear. With regard to these other State agencies, documentation should be provided which indicates the specific areas of jurisdiction and expertise related to uranium milling activities. In addition, the time sequence in which other organizations or individuals become involved and the magnitude of their involvement should be provided. More specifically, the arrangements for making such resources available on a routine and continuing basis should be documented and confirmed by budgetary cost centers to ensure that the required independent environmental appraisal will be completed.

Colorado personnel resources need to be significantly upgraded if these resources are to be adequate for processing license applications and carrying out other regulatory responsibilities.

Current indications are that 2 to 2.7 total professional person years' effort is needed to process a new conventional mill license, in-situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years' effort for support and legal services should be one secretary for approximately 2 conventional mills and 1/2 staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activities of UMTRCA.

Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers, then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers. (Criterion 34).

In order to evaluate the State's compliance with Criteria 34a and b, the level of staff effort devoted to uranium mill regulatory activities and the specialties of the individuals involved should be provided.

EXHIBIT D

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

February 10, 1981

The Honorable John Spellman
Governor of Washington
Olympia, Washington 98504

Dear Governor Spellman:

On December 31, 1966, Washington became an Agreement State under Section 274 of the Atomic Energy Act of 1954, as amended. Under the provisions of this Act, Washington assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Washington applied for and received a grant of $80,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Mr. Gerald E. Thomas, Acting Secretary, Department of Social and Health Services, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Mr. Thomas and his staff and to identify remaining actions which Washington must accomplish for a timely amended agreement.

As a result of information exchanged between the NRC and Washington, in July, 1980, we provided the Department with our initial assessment of the readiness of Washington for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). Additional information was provided by the Department which we have evaluated. The results of this evaluation are discussed in Enclosure 2 to this letter and I would like to highlight specific actions still needed:

1. Revisions to Washington's regulations will be needed to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. Prompt action in advance of the amended agreement as required by the UMTRCA should be taken by Washington to develop upgraded tailings management programs that meet UMTRCA requirements at existing mill sites.

3. In our evaluation of the readiness of Washington, additional staffing will be needed by Washington to meet upgraded requirements of UMTRCA. We will give the same weight to resource commitments as is given to statutory and regulatory enactments.

I wish to acknowledge and commend the State's efforts to expeditiously revise and conform its regulations to meet the requirements of UMTRCA. These past revisions were made based upon earlier draft NRC regulations. Final regulations for uranium mills were issued by NRC on October 3, 1980, the reporting requirements of which became effective January 5, 1981. Many, although not all, of our comments on the Washington regulations reflect differences between the draft and final NRC regulations. We will be pleased to meet with your staff to discuss these differences and to explain our other comments.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining Washington's actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by Washington of the application for amendment.

While, in our opinion, Washington has taken many steps toward compliance with UMTRCA, more needs to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. W. Kerr, Director of NRC's Office of State Programs, 301/492-8170.

Sincerely,

Original Signed By
John F. Ahearne
John F. Ahearne
Chairman

Enclosures:
As Stated

cc: G. Thomas, Washington w/encls.
J. Beare, Washington w/encls.

EXHIBIT D: ENCLOSURE 2

ENCLOSURE 2

WASHINGTON

Written Assessments

The State Environmental Policy Act and implementing guidelines appear to contain adequate authority and requirements for a written analysis of the impact of a proposed activity which would satisfy the requirements of §274o(3)(C) of the Atomic Energy Act (AEA), as amended (WAC 197-10-100, 405, 420, 425). It is understood that the State guidelines permit preparation of the EIS by persons outside the lead agency under the direction of a responsible official within the lead agency. In fact, it is noted that the applicant was listed as a contributor to the recent draft statement prepared on the Dawn project. This has the appearances of conflict of interest. The State must do an independent assessment of each of the environmental impact areas delineated in §274o(3)(C) of the AEA; assessments by applicants or operators cannot be accepted without independent review by the State. It should be demonstrated how independence in the State asesssment is assured. (10 CFR §150.31(b)(2)(iii)). The written assessments required by State regulations appear to satisfy the requirement of Section 274o(3)(C)(iv) with the exception that there is no provision for addressing decontamination.

Regulations

It is noted that the Uranium Mill Tailings Radiation Control Act (UMTRCA) requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable, or more stringent than Commission regulations on uranium milling. The Commission considers that its recently promulgated regulations are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS which addressed operations in both Agreement and non-Agreement States. The Commission regulations constitute minimum national standards (10 CFR §150.31).

In connection with this, the staff has reviewed Washington's regulations, including those which were scheduled for adoption on November 24, 1980. Although the State's regulations address many of the significant issues, they do not adequately cover all of the points in Appendix A to 10 CFR 40 and 10 CFR §150.31(b) (which, as indicated above, constitute minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal). Comments on the specific provisions of the State's regulations in terms of their equivalency to minimum national standards are contained in later sections of this enclosure.

In connection with developing these regulations, the State should recognize that the UMTRCA states that duplication of proceedings conducted by the Commission is not necessary (last sentence of Section 274o of the AEA, as amended). Since the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0705), the State may wish to incorporate the record developed by the NRC as a part of any rulemaking that may be necessary under State law. In fact, the simplest approach might be for the State to adopt language identical to that contained in the NRC regulations.

A detailed review of the Washington regulations is attached.

Immediate Action at Existing Mills

During the interim period (before November 1981) §204(h)(1) of UMTRCA, as amended requires Agreement States to implement NRC regulations to the maximum extent practicable, as stated in the FR Notice issuing the regulations (see 45 FR 65530). The Commission considers it practicable and necessary for Agreement States' mill operators:

(a) to begin now (as opposed to after November 1981) to develop programs meeting the regulations;

(b) to submit such programs to the Agreement States on the same schedule as non-Agreement State operations;

(c) and to immediately implement steps to deal with presently occurring impacts such as blowing of tailings and uncontrolled seepage.

By nature of its participation in the environmental assessment conducted in connection with the Dawn Mining Company license renewal, the NRC staff is aware that some steps are being taken to upgrade operations at this facility. However, at the present time, we are unaware of any steps which Washington has taken in this matter pertaining to the Western Nuclear, Sherwood facility.

Staff Resources and Organizational Relationships

The Washington response indicates that 2.55 staff years' effort is currently dedicated to uranium mill licensing activity. As indicated, this is appropriate for handling a major license renewal; however, it does not take into account the other miscellaneous licensing activities referred to in Criterion 34(a) (SECY-80-472). The specific agreements which document that such services are, in fact, available should be provided. The experience of the individuals who contribute to the 2.55 staff years of effort should also be provided in order for NRC to determine whether these, supplemented by the consultants and other contributing agency personnel referred to, constitute an adequately qualified staff.

The Washington response further indicates that the State understands and acknowledges the requirements of Criterion 33 (a-c). The response states that Department of Social and Health Services (DSHS) staff have begun developing interagency agreements with other State organizations. Charts indicating which other State organizations will contribute to an environmental assessment (presumably those offices with which DSHS is developing agreements) should be provided. A discussion of the area and level of each group's involvement in a review and their corresponding contribution to an assessment would be helpful in understanding State compliance with Criterion 33a. The State response should also include a discussion of contributions from groups within the DSHS other than the Radiation Control Section. The arrangements for making such resources available should be documented, confirmed by budgetary cost centers, and should clearly indicate the lines of communication and administrative control exercised by the lead agency in order to ensure that the required independent environmental appraisal will be completed.

With respect to consultants, we need to know the degree to which the State will rely on consultants, identification of those substantive areas for which consultants will be contracted, an indication of the qualification requirements for such consultants, and the budget planning that will be provided to assure these consultative services will be available on a routine and continuing basis.

Inspections

In Mr. Strong's September 24, 1980 letter to Mr. Kerr, it was stated that inspections of uranium mills will be performed by doing one quarter of a complete inspection four times a year (p.3, Item VI.C.1). We see no problem with this inspection plan provided it is clear that at the end of a year a complete inspection has been performed.

Public Hearings

Opportunity for public hearing must be provided regardless of environmental significance. In addition, the scope of the hearing must extend to the question of license issuance, not merely to the adequacy of the reclamation, disposal, decommissioning and decontamination plan (Section 274o.(3)(A)(i), AEA).

EXHIBIT E

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

OFFICE OF THE
CHAIRMAN

January 29, 1981

The Honorable William P. Clements
Governor of Texas
Austin, Texas 78711

Dear Governor Clements.

On March 1, 1963, Texas became an Agreement State under Section 274 of the Atomic Energy Act of 1954. Under the provisions of this Act, Texas assumed, under agreement with the AEC (now NRC), certain regulatory authority over the use of reactor produced isotopes, the source materials uranium and thorium, and small quantities of special nuclear materials.

Under Section 274 of the Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA), Agreement States can continue to regulate uranium mills and mill tailings after November 8, 1981, by entering into an amended agreement with the NRC. In UMTRCA, the Congress also provided for the first time, funds for grants to States to assist them in preparing their revised regulatory program. Texas applied for and received a grant of $80,000 under that program, thereby indicating the State's interest in pursuing this additional regulatory authority.

For some time, the NRC staff has been working with Dr. Robert Bernstein, Commissioner, Texas Department of Health, and his staff so that the amended agreement process may proceed smoothly. The purpose of this letter is to acknowledge the efforts of Dr. Bernstein and his staff and to identify remaining actions which Texas must accomplish for a timely amended agreement.

As a result of information exchanged between the NRC and Texas, in July, 1980, we provided Dr. Bernstein with our initial assessment of the readiness of Texas for an amended agreement to regulate uranium mills and tailings. Criteria for this purpose have been developed with Agreement State input and State comments were factored in when consistent with NRC rules and policies (Enclosure 1). Additional information was provided by Dr. Bernstein which we have evaluated. The results of this evaluation are discussed in Enclosure 2 to this letter. I would like to highlight several of the actions still needed:

1. Texas has not yet promulgated enabling legislation and implementing regulations to comply with UMTRCA. This is a prime requisite for an amended agreement.

2. Prompt action in advance of the amended agreement as required by the UMTRCA should be taken by Texas to develop upgraded tailings management programs that meet UMTRCA requirements at existing mill sites.

3. In our evaluation of the readiness of Texas, additional staffing will be needed by Texas to meet upgraded requirements of UMTRCA. We will give the same weight to resource commitments as is given to statutory and regulatory enactments.

To execute the amendment, the Commission must find not only that the State uranium milling regulatory program provides adequate protection of the public health and safety and is generally compatible with the Commission's program of regulation, but also that the State has adopted standards for the protection of the public health, safety and the environment from radiation hazards associated with uranium mill byproduct material, which are equivalent to, or more stringent than, those of the Commission. It will be mutually helpful to receive a timetable as early as possible outlining Texas' actions to resolve all the issues discussed in Enclosure 2. In this timetable, we suggest a target date of August 1, 1981, for formal submission by Texas of the application for amendment.

While, in our opinion, Texas has taken some initial steps toward compliance with UMTRCA, there is much to be accomplished before an amended agreement can be reached. We will continue to work closely with your staff towards this end. If you have any questions, please have your staff contact Mr. G. W. Kerr, Director of NRC's Office of State Programs.

Sincerely,

John F. Ahearne
Chairman

Enclosures: As Stated

cc: Dr. Bernstein, Texas w/encl.
D. Lacker, Texas w/encl.

EXHIBIT E: ENCLOSURE 2

Enclosure 2

TEXAS

Progress of Legislation Development

The State does not have legislation in place. There is very little time remaining before it must be in place and the Texas legislative agenda is also limited. Prompt action must be taken. (Criterion 29)*

Long Term Surveillance and Monitoring**

The draft law provides for the establishment of a "Radiation and Perpetual Care Fund" (new section 17 of Texas Act) to cover costs of "maintenance, surveillance or other care on a continuing or perpetual basis after termination of the licensed facility."

1. The draft law nowhere requires the minimization or elimination of the need for active ongoing maintenance of sites over the long term. This is a fundamental requirement of 10 CFR 40, App. A, Criteria 1 and 12 and consistent with Sec. 161.x(2)(A) of the Atomic Energy Act (AEA), as amended, which requires eliminating long term maintenance and monitoring to the extent practicable. While there may be some uncertainty over the degree of ongoing surveillance that will be needed over the long term, the clear thrust of legislation and regulations must be to require the minimization or elimination of active maintenance (See also 12.3.11 and 14.3 of NUREG-0706.) This concept should be stated explicitly in the legislation and implementing regulations. It is suggested the term "Perpetual Care" be dropped from the title of this fund. Experience in other states has indicated that presence of such phraseology has been used by potential mill operators as reasons for not developing programs which eliminate need for ongoing, active care. (Sec. 161.x(2)(A) of AEA).

2. The relationship between financial surety and long-term funding concepts should be clearly established in the statutes or in the regulations. Proposed revisions to the Texas Act (Sections 3(m) 6(f), 16 (a)(4) and 17) are not entirely clear on this matter.

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* Where a reference is made to the Criteria, unless otherwise specified, this refers to the criteria contained in "SECY 80-472," (Enclosure 1).

** Comments on legislation are based on review of draft legislation (marked 2nd draft) of November 13, 1980. Wherever used, "Texas Act" refers to the existing legislation being amended (Chapter 72, Acts of the 57th Legislature, as amended).

The regulations and legislation must assure that adequate financial arrangements are available at all times during mill operation and thereafter to protect the public health and safety. (Criteria 29(b) and 30(a)).

3. Section 17(g) of the proposed legislation should be revised to authorize the agency to transfer funds to the United States for long-term surveillance and control in the event the State chooses not to become owner of a tailings disposal site. The amount of such transfer should be determined at the time of transfer by mutual agreement of the State.

Financial Surety Mechanisms

The legislation as drafted provides adequate authorities for requiring financial sureties. However, it is not clear from the legislation that the State will follow those sections of regulations of the Commission prescribing the acceptability of financial surety mechanisms. (See new Sec. 6(g) of Texas Act.) Texas apparently intends to permit self-insurance which would not meet NRC regulations based on conversations with Texas Department of Health staff. (Criterion 9 in Appendix A to 10 CFR 40).

Immediate Action at Existing Sites

During the interim period (before November 1981) Section 204 (h)(1) of the Uranium Mill Tailings Radiation Control Act of 1978, as amended, (UMTRCA) req [illegible] Agreement States to implement NRC regulations to the maximum [illegible] practicable as stated in the FR Notice issuing the regulations [illegible] 65530). The Commission considers it practicable and necessary for Agreement States' mill operators:

(a) to begin now (as opposed to after November 1981) to develop programs meeting the regulations;

(b) to submit such programs to the Agreement States on the same schedule as non-Agreement State operations;

(c) and to immediately implement steps to deal with presently occurring impacts such as blowing of tailings and uncontrolled seepage.

Regarding this matter, the Texas Department of Health (TDH) was notified in letters from G. W. Kerr dated March 25, 1980, and May 9, 1980, that UMTRCA required that agreement states take immediate steps to acquire a commitment by existing uranium mill operators to specific tailings reclamation programs. Based on our recent review of the Texas radiation control program, we note that we found no documentation that any steps have yet been taken in this matter. (10 CFR 150.31(a)).

Regulations Development

No regulations have been issued (nor even drafted) by the State as required by Section 274.c, Atomic Energy Act (AEA). Prompt action must be taken to develop these regulations. Under any circumstance, the regulations must be in place by November 1981. In connection with regulations development, it is noted that UMTRCA requires that Agreement States have, as of November 1981, regulations which are equivalent to the extent practicable, or more stringent than Commission regulations on uranium milling. The Commission considers that such regulations recently promulgated are practicable to implement in Agreement States as they are based upon the analysis in the final GEIS* which addressed operations in both Agreement and Non-Agreement States. Therefore, the Commission regulations constitute minimum national standards. This appears to be recognized in proposed new Sec. 6A(a)(1) of Texas Act; the regulations developed should likewise reflect this. (Criterion 32 and 10 CFR 150.31).

Also, in connection with developing regulations, the State should also recognize the UMTRCA states that duplication of proceedings conducted by the Commission is not necessary (last sentence of 274.o of AEA). Therefore, because the Commission developed the substantive regulations (45 FR 65521) on uranium mills through a full and public rulemaking proceeding (NUREG-0706), no substantive proceedings need be conducted by the State in developing its regulations. These NRC regulations include the minimum national standards concerning technical, financial and institutional control aspects of uranium mill tailings disposal. The State could incorporate the record developed by the NRC and include it as a part of the rulemaking to help expedite any rulemaking that may be necessary under State law. (Criterion 32).

Also, with regard to regulation development, the State must develop a program for implementation of U. S. EPA fuel cycle radiation protection standards (40 CFR 190) at mills in addition to regulations to be developed under Section 274.o(2).

Related to item 35(a) of the NRC evaluation criteria, the Texas reply of September 29, 1980, to the initial NRC status report lists applicable regulatory guides, standards and other sources that are used in the Texas program. The list seems to be adequate except that the guide, "Information Required and Criteria Used to Evaluate Embankment Retention Systems," (undated) should be deleted because it has been superseded by Regulatory Guide 3.11, which is included in the list. (Criterion 35(a)).

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*GEIS - Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706).

Staff Resources

Texas personnel resources need to be significantly upgraded if these resources are to be adequate for processing license applications and carrying out other regulatory responsibilities.

Current indications are that 2 to 2.7 total professional person years' effort is needed to process a new conventional mill license, in-situ license, or major renewal, to meet the requirements of UMTRCA. This number includes the effort for the environmental assessment and the in-plant safety review. It also includes the use of consultants. Heap leach applications may take less time and is expected to take 1.0 to 1.5 professional staff years' effort, depending on the circumstances encountered. Current indications are that the person years effort for support and legal services should be one secretary for approximately 2 conventional mills and ½ staff years for legal services for each noncontested mill case. The impact on environmental monitoring laboratory services is difficult to estimate but should be added into the personnel requirements.

In addition, consideration should be given to various miscellaneous post-licensing ongoing activities including the issuance of minor amendments, inspections, and environmental surveillance. It is estimated that these activities may require about 0.5 to 1 person years effort per licensed facility per year, the latter being the case for a major facility. These figures do not include manpower for Title I activities of UMTRCA.

Personnel in agencies other than the lead agency are included in these total person year numbers. If other agencies are counted in these numbers, then it shall be demonstrated that these personnel will be available on a routine and continuing basis to a degree claimed as necessary to successfully comply with the requirements of UMTRCA and these criteria. The arrangements for making such resources available shall be documented, such as an interagency memorandum of understanding and confirmed by budgetary cost centers. (Criterion 34).

Preparation of Written Assessments

Several recent assessments performed by the State of Texas (Caithness and Trevino projects) in connection with the licensing of new in-situ uranium extraction projects do not meet the requirements of UMTRCA. (Sec. 274.o(3)(C) of AEA). The assessments did not document detailed evaluation of the most significant environmental impacts that will occur with, and associated controls which will be provided for. the project--those related to groundwater. For example, the following should also be included:

(a) determination of adequate geologic confinement of the ore zone
and associated leach field,
(b) monitoring requirements,

(c) groundwater restoration criteria,
(c) operating limits (including specifications of upper control limits),
(e) plugging of exploration wells and well abandonment procedures, and
(f) well construction and testing. (Criterion 35(b)).

It appears that the Texas Department of Health is relying upon the Department of Water Resources to handle these aspects of project review and permitting. This appears to be acceptable, but the written assessment must document the evaluation that Water Resources performs. /_See Sec. 274.c(3)(C) which requires that the environmental impacts of "any activities conducted pursuant" to the license being granted be included in the assessment._/ Other comments on these assessments are:

- o Most technical aspects of license applications did not appear to receive a rigorous independant review. The State often accepted the data and information submitted by the licensee and did not attempt a separate confirmatory analysis.

- o In our recent review of the Texas mill licensing program, it appears that the Radiation Control Branch (RCB) only considers radiological aspects of mill tailings. This is not consistent with UMTRCA. The State should assure that both radiological and non-radiological aspects of environmental impacts are independently assessed and incorporated into licensing actions and enforced.

The above highlights the need for clarification of organizational relationships between various state agencies involved in the regulatory program for uranium mills and tailings. (Criteria 33(b)).

While the draft of proposed legislation specifically requires a written environmental analysis, it varies from NRC suggested State legislation in not having a separately stated requirement for including long-term impacts, including decommissioning, etc., but rather appears to attempt to subsume long-term impacts under other requirements. The Texas approach (Section 12A(a) is not as clear cut as the suggested approach and should be revised. (Criterion 35(b); Section 274.c(3)(C) of the AEA, as amended.)

EXHIBIT F

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

MAR 1 2 1981

Mr. Charles H. Montange
Covington & Burling
888 Sixteenth Street, N.W.
Washington, D.C. 20006

Dear Mr. Montange:

This is to respond to your request of February 23, 1981 for copies of documents relating to any obligation of the Agreement States to adopt regulations concerning uranium mill tailings.

I am enclosing copies of letters sent in 1981 to Governors Lamm, Clements, King and Spellman from the Chairman on the readiness of their States to enter into amended agreements to permit their States to regulate uranium mills and tailings after November 8, 1981. These letters and their enclosures include discussions of the State's regulations for uranium mill tailings. We expect similar letters will soon be dispatched by the Chairman to Governors Atiyeh, Brown and List. I will furnish you copies of them when they are sent.

Following passage of the Uranium Mill Tailings Radiation Control Act of 1978, our office corresponded with the uranium mill States (as a group) on the requirements of the Act, including State regulations for uranium mills and tailings. Unfortunately, our office is relocating to another building and this portion of our files has been packed for the move. I will furnish you copies of these letters after our files are again available for searching.

Sincerely,

G. Wayne Kerr

G. Wayne Kerr, Director
Office of State Programs

Enclosures:
As stated

EXHIBIT C

February 23, 1981

John F. Ahearne, Chairman
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Chairman Ahearne:

Thank you for your letter of January 29, 1981 regarding an amended agreement under Section 274 of the Atomic Energy Act.

New Mexico has to date made considerable progress toward meeting the requirements of the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978. We are working to promulgate the additional regulations needed for compliance with UMTRCA. Integration of your final rules into New Mexico regulations will proceed according to our State's laws and legal procedures. I am sure that the need to gain full public support for expanded regulatory activities must be fully appreciated by you. Therefore, we must follow our public hearing process. Due to the delay in the Commission publishing its final rules, it may be appropriate to consider advising Congress that the Commission's actions have occupied the majority of the three year action period and request additional time for state action.

Detailed comments on our plans have been prepared by Mr. Thomas E. Baca, Director of our Health and Environment Department's Environmental Improvement Division. His comments are attached.

We remain committed to continued close work with the Commission toward obtaining an amended agreement.

Sincerely,

Bruce King
Governor

BK:gsg

Exhibit H

Items On Which NRC Relies But Which Were Not Made Available For Comment

The following items upon which NRC relies[1] were made publicly available only after the public comment period:

Battelle - *Measurement of Radon Diffusion from Uranium Mill Tailings Piles* (Vol. 5, no. 2);

Battelle - *Diffusion and Exhalation of Radon from Uranium Tailings* (Vol. 5, no. 5);

Battelle - *Prediction of the Net Radon Emission from a Model Open Pit Uranium Mine* (Vol. 5, no. 6);

Battelle - *Radon-222 Emissions in Ventilation Air Exhausted from Underground Uranium Mines* (Vol. 5, no. 7);

Battelle - *An Investigation of Radon-222 Emissions from Underground Uranium Mines* (Vol. 5, no. 8);

EPA - *Particle Size Distribution of Yellowcake Emissions at the United Nuclear-Churchrock Uranium Mill* (Vol. 6, no. 1);

ANL - *Radioisotopic Composition of Yellowcake - An Estimation of Stack Release Rates* (Vol. 6, no. 2);

ANL - *Radon and Radon-Daughter Concentrations in Air in the Vicinity of the Anaconda Uranium Mill* (Vol. 6, no. 3);

ANL - *Appendix to Radon and Radon-Daughter Concentrations in Air in the Vicinity of the Anaconda Uranium Mill* (Vol. 6, no. 4);

ORNL - *The Uncertainty Associated with Selected Environmental Transport Models* (Vol. 6, no. 6);

Nureg/CR-1495 - *Model Assessment of Alternatives for Reducing Seepage from Buried Uranium Mill Tailings at the Morton Ranch Site in Central Wyoming* (Vol. 6, no. 10);

Nureg/CR-1494 - *Interaction of Uranium Mill Tailings Leachate with Soils and Clay Liners* (Vol. 6, no. 11);

Nureg/CR-1081 - *Characterization of Uranium Tailings Cover Materials for Radon Flux Reduction* (Vol. 7, no. 4) (only "draft" version available for comment);

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[1] All items in this list were included by NRC in its "certified index of the record."

FBDU-258 - Radon Diffusion and Cover Material Effectiveness for Uranium Tailings Stabilization (Vol. 7, no. 5);

ORNL/TM-7065 - Removal of Hazardous Radionuclides from Uranium Ore and/or Mill Tailings (Vol. 7, no. 7);

Nureg/CR-1583 - Radon Release and Dispersion from an Open Pit Uranium Mine (Vol. 8, no. 2);

Nureg/CR-1253 - Battelle - Methods for Assessing Background Levels of Radiation and Radioactive Materials in the Environment Around Uranium Mills (Vol. 8, no. 4);

Letter Fort to Eadie and draft copy of ORP-LVF Report (Vol. 8, no. 5);

Letter to Myrick to Miller and Figures concerning 226 Ra soil with attachment (Vol. 8, no. 6).[2]

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[2] The great majority of these studies were not even completed until after the comment period. Furthermore, although certain of the studies are dated (indicating completion) prior to the close of the public comment period, it does not appear that these documents were made available for inspection at the NRC's Public Document Room until after the comment period. For instance, the Battelle Study at Vol. 5, no. 6, although dated September 1979, was stamped as having been received by NRC's Public Document Room on December 10, 1979.

EXHIBIT I ecn

WESTERN NUCLEAR, INC.

EXECUTIVE OFFICE · SUITE 640
134 UNION BOULEVARD · LAKEWOOD, COLORADO 80228 · (303) 986-4371

May 24, 1979

Mr. Hubert J. Miller
Director, Division of Waste Management
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

RE: Nuclear Regulatory Commission, Draft Generic Environmental Impact Statement, Uranium Milling
44 Fed. Reg. 24963, April 27, 1979

Dear Mr. Miller:

Due to the difficulty and time-consuming procedure to obtain sufficient copies of the draft GEIS and the time required to carefully evaluate and review the two documents by July 26, 1979, Western Nuclear, Inc. respectfully requests the comment period be extended an additional 90 days. In addition, Western Nuclear believes an extension of the comment period is warranted since numerous References referred to in the Draft GEIS are not available for our review due to statement "in preparation".

It is also our understanding public hearings may be scheduled for the early part of July. WNI wishes to also express concern the limited time available will not give those testifying the opportunity to develop position papers which will serve to meet the purpose and benefits of public hearings. We therefore request the public hearing dates be also postponed for a period of 90 days.

Should there be any questions regarding this request, please advise. Your cooperation is greatly appreciated.

Sincerely,

Grey Bogden

Grey Bogden
Director of Environmental
& Industrial Safety

GB:bt

cc: P.R. Miller
T.A. Kippen

EXHIBIT J

JUL 9 1979

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 2 9 1979

Mr. Grey Bogden
Director of Environmental
and Industrial Safety
Executive Office, Suite 640
134 Union Boulevard
Lakewood, Colorado 80228

Dear Mr. Bogden:

In your letter of May 24, 1979, you requested, an extension of the comment period on the Draft Generic Environmental Impact Statement (GEIS) on Uranium Milling.

The staff has considered this request and has decided to grant such an extension for a period of sixty days. This extension is also given so that the regulation changes which will be proposed shortly incorporating conclusions of the GEIS and certain provisions of the "Uranium Mill Tailings Radiation Control Act of 1978" can be considered in conjunction with the GEIS. We expect the regulation changes to be issued shortly. Therefore, according to the new schedule, comments on the Draft GEIS will be accepted until September 24, 1979. Public hearings on the GEIS and associated proposed regulation changes will be held in September. Notice of the comment period extension and specific information concerning public hearings will be given in the Federal Register.

In making your request you noted that there were references to reports (primarily involving research work) that are in preparation. Your letter requested that the period of extension begin after references (primarily to reports of ongoing research activities) are available for public review. The research reports referred to in the text are those which are being produced in connection with continuing programs of research on uranium milling sponsored by NRC and being conducted by several national laboratories. Recognizing that formal research reports on work done to date would not all be available on a schedule which would support GEIS schedules, the staff chose to conduct its assessment utilizing the best information available; in some cases this involved utilizing preliminary information from these research activities. In most cases where this has been done, the preliminary data itself is presented in the document. In other cases, the research information is not relied upon by itself but is referred to as being generally supportive of estimates the staff is making based on other referenced reports.

In this connection, I should note that a number of reports referred to in the GEIS as being "in preparation" have been issued or are very near being issued. Attachment A to this letter gives a summary of the status and availability of such reports. The NRC Public Document Room (PDR) is being supplied with informal reports and information on referenced research efforts for which formal reports are not yet complete. The PDR is also being supplied with copies of references which are not readily accessible to the public, such as referenced letters and memos. Information on the GEIS will be filed in the PDR under Project M-25.

In summary, the analysis and conclusion of the GEIS rest on technical bases that are presented fully in the GEIS and in references available in the open literature; they do not hinge upon information contained in unpublished research reports. I believe the comment period extension of sixty days should be sufficient to conduct a thorough review of the GEIS.

We welcome and look forward to comments from the uranium milling industry. We trust your participation will be most valuable in preparation of a final GEIS and associated regulation changes.

Sincerely,

JBMartin

John B. Martin, Director
Division of Waste Management

Enclosure: As stated

ATTACHMENT A

This is a listing of recently issued reports referenced in the Generic Environmental Impact Statement (GEIS) on Uranium Milling. These reports are available at three locations: NRC Document Control (in limited supply); the NRC Public Document Room; and NTIS. These organizations can be contacted at the addresses found at the end of this attachment.

Overview, page 31; references:

3. C. C. Travis, et. al., "A Radiological Assessment of Radon-222 Released from Uranium Mills and Other Natural and Technologically Enhanced Sources," Undertaken by the Oak Ridge National Laboratory for the NRC, NUREG/CR-0573, February, 1979.*

6. Battelle Pacific Northwest Laboratory, Atmospheric Sciences Department, Series of Reports on Uranium Mill Research Program, 1979.*

   - L. C. Schwendiman, et. al., "A Field and Modeling Study of Windblown Particles from a Uranium Mill Tailings Pile--Interim Report," NUREG/CR 0629, April, 1979.

7. Argonne National Laboratory, Division of Environmental Impact Studies, Series of Reports on Uranium Mill Research Programs, 1979.

   - R. B. Holtzman, et. al., "Contamination of the Human Food Chain by Uranium Mill Tailings Piles," Argonne National Laboratory, NUREG/CR-0533, April, 1979.*

   - M. H. Momeni, Y. Yuan, and A.J. Zielen, "The Uranium Dispersion and Dosimetry (UDAD) Code," Argonne National Laboratory, NUREG/CR-0553, 1979.

8. Ford, Bacon and Davis Utah, Inc., "Characterization of Uranium Tailings Cover Materials for Radon Flux Reduction," Draft, FBDU-218-1, January 1979.

11. U.S. Nuclear Regulatory Commission, "Description of the Uranium Milling Regions," prepared by Argonne National Laboratory, NUREG/CR-0597, 1979.*

Appendix C, page 7:

17. same as above reference #3 above.

Appendix G, Page 14:

16. Letter from R. L. Douglas, Office of Radiation Programs-Las Vegas Facility, U.S. Environmental Protection Agency, to W.E. Kisieleski, Argonne National Laboratory, unpublished preliminary data on yellowcake stack tests at selected uranium mills during 1977-1978, October 2, 1978.

*Available at NRC Document Control (in limited supply).

Appendix G, page 27:

7a. L. M. McDowell-Boyer et al., "Review and Recommendation of Dose Conversion Factors and Environmental Transport Parameters for Pb-210 and Ra-226," Oak Ridge National Laboratory, NUREG/CR-0574, 1979.

NRC Public Document Room
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Division of Technical Information and Document Control
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555
Phone (301) 492-7333

National Technical Information Service
Springfield, Virginia 22161

*Available at NRC Document Control (in limited supply).

EXHIBIT K

TESTIMONY OF GORDON T. SWANBY

COST UNDERESTIMATES IN THE DRAFT GEIS

My name is Gordon T. Swanby. I am Vice President of Environmental and Engineering of Atlas Minerals which is a division of Atlas Corporation. Today, however, I am going to discuss on behalf of AMC the approach to costs and the cost data contained in the draft GEIS.

Because of my 25 years experience as a project manager with a major engineering contracting firm I have developed and reviewed many cost estimates. I appreciate the problems encountered by the writers of the draft in attempting to assemble accurate cost figures. I once prepared an estimate on a small project for a client and I informed the client the cost would be $5,500. He was so delighted I decided to check my estimate further and much to my chagrin I found the cost was $55,000. I recently dealt with an estimate for installing a scrubber at a power plant to comply with EPA air pollution regulations. The original estimate was $5.8 million. The final installed cost was well in excess of $25 million. From these and many other experiences I have learned that it is far easier to underestimate costs than to overestimate them.

Underestimating often occurs when a project is not thoroughly engineered and understood down to the smallest details. The basic attitude towards costs and cost data in the draft GEIS has led almost inevitably to serious cost underestimates. The result of this attitude is a lack of detailed engineering. This attitude is reflected in the statement on page 12-6:

> **"These costs are still considered to be reasonable given the significant benefit associated with them (elimination of the need for continued active maintenance), and because they represent a very small fraction of the price of product or the cost of producing electricity." (Emphasis added)**

Thus the draft GEIS assumes that detailed cost estimating is not warranted. This rationale is invalid. We will demonstrate with examples that the costs of compliance with certain of the proposed licensing criteria are truly significant and will noticeably increase the public's utility bills if finally promulgated in the present form.

With reference to costs of alternative mill tailings management programs the draft GEIS states on page K-11:

> "The staff considers the cost estimates to be adequate for the comparison of alternatives and to support decisions regarding generally applicable regulations."

We concur with the staff that the cost estimates are adequate for the comparison of alternatives for a model mill. However, we have concluded that these estimates are not accurate enough to be used to support regulatory decisions involving real mills.

Let me now turn to some specific cases where the draft GEIS has inaccurately estimated major costs.

Page K-26, Sec. 1.1 discusses the problem of achieving radon attenuation where clay is not available for use as cover material. It states that this 9 million cu. yds. of material can be put into place for $9 million. This $1.00/cu. yd. cost figure is arrived at using $0.75/cu. yd. for excavating, loading and hauling, and $0.25/cu. yd. for spreading and compacting as per Table K-4.1.

Unfortunately, this overlooks the fill required for embankment slopes. This oversight amounts to 4 million cu. yds. based on a minimum slope of 5:1 -- the prudent, conservative measure discussed on page 9-36. Thus the total cover material requirement is 13 million cu. yds rather than 9 million cu. yds. (See attached chart)

The draft GEIS also assumes cover material will be available on site, free of cost. Although we know of no mill site that has 13 million cu. yds. available on the site for excavation, for purposes of discussion, let's assume free dirt on site. If we limit the depth of excavation of this free dirt to 3 ft., we will need to remove 3 ft. of soil from 2,687 acres (or over 4 sq. miles) to obtain 13 million cu. yds. of material.

After this has been done there undoubtedly will be regulatory requirements to resurface and revegetate this borrow area. A recent composite of industry estimates of revegetation costs indicates the cost would be on the order of $5,000 per acre, which in this example results in a total revegetation cost of $13,433,000.

Assuming that scraping up 4 square miles of dirt is not reasonable, another alternative would be to excavate a pit 60 ft. deep to provide the cover soil, but such a pit would require 134 acres plus the side slope areas. This 60 foot hole would be about 2200 feet square. The proposed criteria indicate that such holes should be backfilled and the next question which arises is -- where will this 13 million cu. yds. of fill come from?

Recently I have been deeply involved in trying to determine what costs would be involved in complying with the draft GEIS tailings cover requirement. To date the only nearby clay we have found is on BLM land. We have no idea what this clay might cost but we are certain that the material will not be free.

We have found some dirt that can be delivered for about $2.00/cu. yd. After assessing all available data we believe the acquisition charge for the 13 million yards discussed above should be estimated at no less that $3.00/cu. yd. or $39 million. We don't know at this juncture whether it would be cheaper to rehabilitate the 60 ft. pit or to revegetate the 2,687 acres. But for the moment we will assume they are equally costly ($13 million).

Thus, the total cost for this entire operation is not $9 million, as discussed in the draft GEIS, but will require $39 million for material acquisition, $13 million for placing and compacting and $13 million for revegetation or rehabilitation of the borrow pit. The total cost would be $65 million, over seven times the draft GEIS figure. Even this calculation excludes costs such as interest.

With regard to Item 4, Evaporation Pond, on page K-6, the total cost of $1.72 million for 40 hectares (or 100 acres) appears reasonable for the work performed. However, this estimate assumes a perfectly level site, free dirt, no pipelines or pumping facilities, no access roads, and no weather protection costs. When this total scope of work is considered, it will probably double this cost.

With regard to site decommissioning, Table K-7.1 states that the buildings and machinery can be removed without cost.

This might be valid for commercial warehouse type buildings but is no a valid assumption in the uranium milling context where the proposed criteria would require that heavy concrete foundations be broken up and hauled to the tailings pond. According to the cost data of one o the leading engineering-contractors, the demolition cost for concrete is $20/cu. yd. Assuming the hauling and disposal cost for this concr would be $10/cu. yd., then the total cost for this item alone is about $250,000.

Another major engineering-contractor estimates demolition costs to be 6.5% of the capital cost. Thus demolition of a $30,000,000 mill would cost $1,950,000. The draft GEIS quotes, on page K-32, as substantiation for their "No Cost" concept, a letter from a Mr. Gary Beach, of the Wyoming Department of Environmental Quality. We suggest that the operating contractors that actually do demolition work are a much more credible source for estimating information than Mr. Beach.

In summary, it is AMC's position that the draft GEIS assumption of no cost for building and machinery removal is not valid.

Turning to the draft GEIS discussion of the construction cost of a mill. Appendix K-4 sets forth a total cost of $7.1 million for mill equipment. It is not clear whether this figure ($7.1 million) is intended to represent the total cost of a mill. If it is, it is seriously deficient as current engineering estimates for a complete mill with a 2,000 tons per day capacity vary from $25-45 million.

Finally, the draft GEIS does not address the costs of regulation. I have personal knowledge of one company that has spent over $1 million in recent years preparing various reports in an attempt to get a license renewed. Another company has to date, spent in excess of $1 million trying to get an agreement with NRC on a tailings disposal plan. They have estimated on the public record that their total regulatory costs before they finally obtain a license will be $1.5-2 million.

An even more significant regulatory cost is the interest cost imposed by regulatory delays. The largest single cost in constructing a nuclear power plant today is the interest cost during construction or "IDC". This is a larger cost than either labor or materials. All this IDC cost is not necessarily attributable to regulatory delay in every case but in many cases a substantial portion is. One uranium develoner has estimated his IDC cost to be over $50,000/day. If we add the IDC cost to the $65,000,000 discussed above, this IDC charge alone would probably be more than the GEIS total cost estimate of $9,000,000. A thorough presentation of costs must include these items.

Earlier in this presentation I alluded to the ultimate cost to the consuming public. If a thorough presentation of costs is made it will undoubtedly show that the 1% increase in the cost of yellow cake assumed in the GEIS will be closer to 3% or more. A recent calculation of the effect of a 3% increase (using the 2.5c/Kwh cost of electricity set out on page 12-4 of the draft GEIS) indicates that utility bills will be increased by at least $100,000,000/year.

In conclusion, the improper approach and the examples of inaccuracies and omissions discussed above, make it clear that the cost estimates contained in the draft GEIS are not sufficiently accurate for use in any meaningful cost-benefit analysis. Therefore, it is our recommendation that the cost data be redone with particular emphasis on the secondary costs that will be involved such as the cost for acquiring dirt, the cost of rehabilitating any borrow areas, and IDC costs.

EXHIBIT L

HEALTH
ENVIRONMENT
department

STATE OF NEW MEXICO
ENVIRONMENTAL IMPROVEMENT DIVISION
P.O. Box 968, Santa Fe, New Mexico 87503
(505) 827-5271
Thomas E. Baca, M.P.H., Director

Bruce King
GOVERNOR

George S. Goldstein, Ph.D.
SECRETARY

Larry J. Gordon, M.S., M.P.H.
DEPUTY SECRETARY

April 15, 1981

U.S. Nuclear Regulatory Commission
1717 H Street, N.W.
Washington, D.C. 20555

Gentlemen:

For the reasons set forth below the Environmental Improvement Division of the State of New Mexico requests that the effective date of the Nuclear Regulatory Commission's Uranium Mill Licensing requirements promulgated at 45 Fed. Reg. 65521-38 (October 3, 1980) be stayed until six (6) months after the final court decision in Kerr-McGee Nuclear, et al. v. NRC C.A. No. 80-2043 (Tenth Circuit).

The reason for the State's request is to enable the State sufficient time to adopt compatable State regulations after the NRC regulations are no longer subject to change by outside entities. State regulatory hearings are expensive, lengthly and require substantial preparation and participation of the State Radiation Protection Bureau staff. In light of the pending litigation, the New Mexico Environmental Improvement Division's resources would better be spent in licensing and compliance activities until such time as the regulations are no longer subject to change by the court. At that time, there will no longer be a risk of holding two hearings, the first to meet the November, 1981 statutory deadline and attain compatability with the existing requirements and the second to comply with possible changes resulting from the court's decision.

New Mexico's existing regulatory requirements, particularly those found in Parts 3 and 12 of the Environmental Improvement Board's Radiation Protection Regulations, will adequately protect the substantive areas of immediate concern in New Mexico during the time in which the stay would be in effect. While New Mexico will need further regulatory changes to ultimately come into full compliance with the Mill Tailings Act, there should be no significant harm resulting from the requested stay of the NRC regulations.

New Mexico has diligently proceeded to adopt both statutory and regulatory amendments in its efforts to comply with the requirements of the Mill Tailings Act. We will continue to do so. We greatly appreciate you consideration of this request for a stay and look forward to working with the Commission and its staff in the future.

Sincerely,

Bruce S. Garber

BRUCE S. GARBER
Chief Attorney

BSG/lg

Exhibit D

Page

BEFORE THE

STATE OF NEW MEXICO

ENVIRONMENTAL IMPROVEMENT DIVISION

IN THE MATTER OF:)
)
RADIATION TECHNICAL ADVISORY)
COUNCIL HEARING)

TRANSCRIPT OF PROCEEDINGS

BE IT REMEMBERED that on to-wit, the twenty-eighth day of May, 1981, the above-entitled matter came on for hearing before the Radiation Technical Advisory Council, Room 320, Executive-Legislative Building, Santa Fe, New Mexico, at the hour of nine thirty-o'clock in the forenoon.

* * * *

AFTERNOON SESSION

MR. CROUT: Now, in terms of the risk to the individual, let me ask you this: Didn't you use only four things to come to the two pico curies limit, one risk to individual; two, population exposures; three, cost; and four, long-term and physical isolation?

MR. MILLER: I think those are the four broad areas, right.

MR. CROUT: Now, risk to the individual, the two pico curies on risk to the individual is based on the assumption, is it not, that a person could live upon that tailings pond if he didn't build a basement into it, and still meet the surgeon general's standards?

MR. MILLER: As I said in my remarks that prospective was developed in a number of different points, how faraway a house is, nearer and nearer. The worst possible case is the one where you're right very near it, or even on top of it.

MR. CROUT: Let's assume you're saying, though, that in that case, you're requiring a failure of the government, after we give them the deed to these tailings for that to happen.

MR. MILLER: A very, very long term.

MR. CROUT: And you would agree that that involved the thought of the failure of the government before we give them the deed?

MR. MILLER: Well, it most certainly does.

MR. CROUT: Now, assuming that you used a thirty pico curies level for -- as indicated by Doctor Schiager, on the risk to the individual, apart from the land the tailings are located on, that would meet the surgeon general's requirement, also, would it not, on risk to the individual?

MR. MILLER: I would have to look at the figures, but, you know, the surgeon general's requirement is rated. And as I've said before, this level is within the point oh one part of the surgeon general's guidelines. It's -- I believe it's point oh three six, or point oh oh four, working levels.

MR. CROUT: Point oh oh four, right.

MR. MILLER: Right.

MR. CROUT: But now taking the situation, historically, you regulated that to the general population, past the fence line of the uranium mill, have you not?

MR. MILLER: Yeah.

MR. CROUT: And assuming that we could --

MR. MILLER: I'm talking -- I'm going to

Statement of
Mr. Edward C. Gibbs,
Vice President and General Manager
Uranium
Rocky Mountain Energy Company
Broomfield, Colorado

Before the
Subcommittee on Nuclear Regulation
of the
U.S. Senate Committee on
Environment and Public Works
June 16, 1981

Mr. Chairman and Members of the Nuclear Regulation Subcommittee, my name is Ed Gibbs and I am Vice President and General Manager of Uranium for Rocky Mountain Energy Company. With me today from Rocky Mountain Energy Company is Dr. Lyda W. Hersloff, Environmental Specialist. We are very pleased to have this opportunity to present our views concerning federal uranium policies and uranium regulations which affect the viability of the domestic uranium industry.

Rocky Mountain Energy is the Denver-based subsidiary of the Union Pacific Corporation. RME is responsible for developing the Corporation's coal, uranium, trona and other reserves. As part of a joint venture with Mono Power Company, a subsidiary of the Southern California Edison Company, RME currently operates the Bear Creek Uranium Company in the southern Power River Basin in Wyoming. In addition to other energy projects, RME is conducting uranium in situ leach research and development and uranium exploration operations throughout the United States.

Bear Creek Uranium

The Bear Creek Uranium deposit was discovered by RME geologists in 1967. Environmental studies were begun in early 1974 and data was collected on vegetation, wildlife, water and air quality, archaeology, climate, topography, soils and historical values. Socioeconomic research included surveys on the availability of housing, educational, medical and recreational facilities in the area. This detailed information was used in the planning of the Bear Creek project and also became part of the draft Environmental Impact Statement prepared by the U.S. Nuclear Regulatory Commission, the U.S. Forest Service, and the U.S. Geological Survey. Following a series of public meetings to review the statement and receive comments on the project, a final comprehensive Environmental Impact Statement was published in June 1977.

An extensive environmental program was designed for Bear Creek. Continuous evaluation of tailings management, air and water monitoring programs and reclamation efforts have received considerable attention by RME so that the utmost care has been provided and will continue to be provided to protect the environment and the public health and safety.

At this time, I would like to focus my comments on specific Nuclear Regulatory Commission regulations promulgated pursuant to the Uranium Mill Tailings Radiation Control Act. In addition, I would like to address Environmental Protection Agency authority to set standards for uranium milling and mill tailings operations. Rocky Mountain Energy is not opposed to the laws and the intent of the uranium regulatory program proposed by Congress.

We are concerned, however, with how the regulatory agencies have interpreted and implemented the authority vested in them by Congress. For example, RME submitted comments to the Nuclear Regulatory Commission on the Draft Generic Environmental Impact Statement which addressed uranium operations. To our knowledge, we cannot point to any substantive changes in conditions and/or criteria by the NRC as a result of these comments.

Uranium Mill Tailings Licensing Criteria

The uranium mill tailings licensing requirements were promulgated in final form in 1980 by the Nuclear Regulatory Commission in order to establish a regulatory program to ensure proper management and disposal of mill tailings and mill decommissioning. As a result, a set of twelve specific criteria were incorporated as an Appendix to Part 40 of the Title 10 of the Code of Federal Regulations.

The final NRC regulations are untimely because they were "based" on standards not yet promulgated by the Environmental Protection Agency. Consequently, the Appendix to Part 40 Title 10 may need revision when the EPA standards are promulgated.

The Appendix "establishes technical, financial, ownership and long-term site surveillance criteria relating to siting, operation, decontamination, decommissioning, and reclamation of mills and tailings or waste systems and sites at which such mills and systems are located." While we support the objective of these criteria, we believe that the criteria should not address specific methods to accomplish these goals.

To establish by rule, techniques or methods is to assume that there is nothing new to learn. In addition, the technical criteria of Appendix A 10 CFR 40, are technologically constraining since these criteria are based upon assumptions related to a hypothetical model mill and environmental setting. For example, Criterion 4 states

> "the following site and design criteria shall be adhered to whether tailings or wastes are disposed of above or below grade...where full vegetative cover is not likely to be self sustaining due to climatic or other conditions, such as in semi-arid and arid regions, rock cover shall be employed on slopes of the impoundment system."

Reclamation efforts at Bear Creek Uranium Company demonstrates that effective revegetation to control erosion is possible in semi-arid environments using a multiple sequence of mulch and subsequent mixture of native vegetation. Rock cover should not necessarily be required in semi-arid and arid environments where satisfactory revegetation can be demonstrated. Further, the cost of rock cover as required by the regulations may be prohibitive due to the scarcity of rock available.

Executive Order 10244 mandated that agencies review the economic impact of proposed regulations. This procedure was not followed by the NRC in evaluating some of the technical criteria. Failure of the NRC to adequately balance the economic impact and the corresponding health benefits can be seen in its standards for radon releases from uranium operations. For example, concerning radon attenuation[1], the following statement was made in the final Generic Environmental Impact Statement (Section 12.3.4.6),

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[1] Radon attenuation is the reduction in the amount of radon gas generated by tailings which escapes to air through a specified thickness and/or type of cover material.

> "the staff considered, but determined it would be impractical and inappropriate making a fully 'monetized' incremental cost benefit optimization the basis for establishing limits on radon flux given the complex multi dimensional and long-term nature of the mill tailings disposal problem."

The present regulation calls for a limit on radon release rates from tailings equal to 2pCi/m^2-sec. This limit is substantiated on the basis that 2 pCi/m^2-sec

> "appears best to meet the objective of reducing fluxes to levels which are within the range occurring naturally from almost all soils" (FGEIS, Section 12.3.4.2).

The range of natural background radon release rates (flux) used in the above quotation appears to be based on a national average rather than an average from uranium producing areas. Flux rates of 3-5 pCi/m^2-sec are not uncommon in these areas as stated by the NRC, "While in limited isolated areas, natural flux can be quite high (for example, it can be an order of magnitude or more greater than the average)" (FGEIS, Section 12.3.4.2). Further,

> "this limit represents approximately 0.002 percent of the annual dose due to radon from that due to background radon from soils. The dose from radon due to uranium mill tailings is 370 organ-rem. Higher population exposures will result from soil tillage (420,000 organ-rem), building interiors (4,900 organ-rem) and reclaimed land from phosphate mining (4.9 x 10^3 organ-rem)"(FGEIS -Section 12.3.4.4).

The justification for this radon limit for uranium mill tailings obviously is not on the basis of acceptable risks to society nor does it appear to be on the basis of health and safety. However, individual uranium operators are being asked to spend from 5 million to 7 million dollars to meet this lower radon limit

(FGEIS -Section 12.3.4.5.2).

The costs which were estimated by the NRC in the FGEIS were significantly lower than industry estimates by 50 to 100 percent. The NRC estimated that tailings disposal per the "prime option" of below grade disposal would cost between 10 and 21 million dollars (Table 12.1 FGEIS). The estimate in Table 12.1 of the FGEIS for above grade disposal is 9 million dollars. The incremental cost difference between above grade and below grade disposal is 1 million to 12 million dollars over the NRC estimate. The NRC has not shown that below grade disposal significantly increases the safety factor, therefore, these additional costs for below grade disposal are not justified.The rules and regulations promulgated by the NRC to insure proper tailings management should be justified on the basis of cost/benefit as well as public health and safety. It has not been shown that the added health benefit accrued from below grade disposal and other criteria necessitate the associated costs.

Rocky Mountain Energy strongly recommends that the Nuclear Regulatory Commission uranium mill tailings regulations be suspended and reconsidered in order to provide some discretion for uranium producers to meet the necessary standards to protect the public health and safety. In addition, the NRC should be required to reconsider on a cost benefit basis the impact of the regulations. Further consideration should also be given to the development of final EPA standards prior to the enactment of the NRC regulations.

EPA Radiation Protection Standards for Nuclear Power Operations, 40 CFR 190

The EPA Environmental Radiation Protection Standards for Nuclear Power Operations, 40 CFR 190 (See 42 U.S.C. 2201 (b)) require that whole body radiation exposure to any member of the general public from any nuclear power operation including milling be limited to less than 25 mrem/year. This limit represents a 95% reduction in allowable exposure from the previous limit of 500 mrem per year to any individual in the general public. Rocky Mountain Energy strongly recommends that the EPA be required to review the basis of this standard as the 25 mrem level will pose substantial costs to uranium operations without commensurate benefits to the public health and safety.

The 25 mrem/year is equivalent to 8 round trip air flights between Denver and Washington D.C. or the difference in cosmic radiation resulting from a move from the east coast to Denver, Colorado. Further, natural background radiation from cosmic rays and terrestrial radiation varies diurnally and seasonally with soil moisture, porosity, snow cover, and solar flares, to mention a few. The total variability over time in natural background radiation may be as great as 10 percent as given in Natural Background Radiation in the United States, (NCRP #45)). In the Rocky Mountain area, where most of the U.S. uranium production occurs, the natural background radiation dose is approximately 200 mrem/year. Therefore, with a variation of 10%, the exposure at any one time naturally may be greater than 200 mrem/year by 20 mrem.

The Environmental Protection Agency has stated that:

> "the standards generally represent the lowest radiation levels at which the agency has determined that the costs of control are justified by the reduction in health risk."

Based on recent developments such as new cost data for source term controls, and new health effect conversion factors to determine risks, however, the 40 CFR 190 radiation protection standards are determined to be neither practicable nor cost-effective.

EPA's determination of an acceptable societal cost per health effect averted was $250,000-$500,000. In 1976, EPA estimated the cost for each uranium mill to meet the 25 mrem standard would range from $290,000 to $860,000 for the 1976 model mill. Using the same levels of control for mills in 1980, the cost is estimated to be from $864,000 to $1,814,000, or a factor of two greater. The level of control obtained by spending $1,814,000 to meet the 25 mrem standard based on the EPA model, would reduce life expectancy lost to 0.04 days.

This risk is one or two orders of magnitude below the loss of life expectancy due to such risks as living in a brick house versus a wood house (8 days), drinking diet drinks (2 days), or coffee (6 days), or from medical x-rays (6 days). Based on the low levels of risk and the high cost of implementation, it is apparent that the Environmental Protection Agency did not balance risks against costs of control. Further, the NRC, at hearings held on March 8-10, 1976, testified that 1) EPA had incorrectly assessed radioactive effluent control technology and the practicability of compliance with the proposed standards; 2) the proposed standards would be impracticable to implement for technical and economic reasons for major components of the uranium fuel cycle, notably mills; and 3) that it would be impossible to demonstrate compliance at the low levels specified in the standards using environmental monitoring.

One of the obvious results of these standards is an increase in the cost of yellowcake production, making it increasingly difficult for domestic producers to be viable contenders in the market place. Presently, licensees in general and Bear Creek Uranium Company specifically are required to monitor levels of airborne radioactive particulates, radon, and radioactivity in surface and ground water in the environs of milling operations. The 25 mrem standard would require more extensive monitoring at levels inclusive in natural background variation at a cost which will not result in additional benefits to the public health and safety. Since the costs of control for uranium mills to meet this standard are exorbitant with little justification, it is suggested that EPA be required to review and amend 40 CFR 190 as it applies to uranium milling.

Proposed EPA Disposal and Clean-Up Standards for Inactive Uranium Processing Sites

The proposed EPA Disposal and Clean-Up Standards for Inactive Uranium Tailings Processing Sites seek to reduce from tailings piles the emissions of radon-222, airborne particulates, waterborne radioactive materials and external gamma exposure. It should be noted that the limits set by the EPA for clean up are, in some instances, below the levels found naturally.

For example, the EPA level of radium in soil (5pCi/g) established for clean up of inactive uranium tailings is a level which is within the range of natural radium concentrations in some areas. According to a study submitted by the American Mining Congress (AMC) to the EPA in response to the EPA advanced notice of Proposed Rulemaking on Hazardous Waste, March 9, 1979, 5pCi of radium-226/g of soil is an unrealistic standard. The analytical error, alone, associated with determining a level of 5 pCi of radium-226/g in soil may be almost 60% of the level, e.g. 60% of 5Ci/g = 3pCi/g.

Another topic addressed by EPA in the regulations is radon concentrations in buildings located on the mining and milling site. EPA states that:

> "There is a health risk associated with radon decay products. Their concentration in an existing or future building will depend on the radium concentration in the soil under or adjacent to it."[3]

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[3] EPA 520/4-80-011, Dec. 1980, p. 7-3.

The EPA argued that a level of radium in soils of 5pCi/g will result in an indoor radon decayproduct concentration of 0.01 WL[4]. As per an NRC document entitled "Potential Exposure from Radon Inside Structures on Contaminated Land", a level of radium of 5pCi/g would result in a range of 0.0024 - 0.04 WL units inside structures built on this land. This wide range of working level points out the questionable validity of the use of a radium-226 standard for remedial action in order to achieve a specified WL for indoor structures. For example, the regulated 0.01 WL for radon within occupiable buildings at an operating processing site is less than levels existing naturally in a large fraction of houses in the country not associated with tailings. EPA's Table III-1 (following page), "Indoor Radon and Radon Decay Product Levels", compiled by the Office of Radiation Programs, indicates the levels of radon in the basement or first floor of a home in New York or New Jersey would exceed the standard of 0.01 WL by 39% and 17% respectively.

The cost of implementing these standards at a designated inactive site is estimated to range from 1 to 78 million (1979) dollars per pile with an estimated average cost per pile of 11 million (1979) dollars. This cost is unreasonable especially since the standards for clean-up of uranium processing sites in some cases require clean-up to levels below those which occur naturally. The EPA estimates that there may be 2 premature deaths

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[4] WL -"working level" is defined as any combination of short-lived radon-222 daughters, Polonium-218, Lead-214, Bismuth-214 and Polonium-214, in one liter of air, without regard to the degree of equilibrium that will result in the ultimate emission of 1.3 x 10^5 MeV of alpha particle energy (10 CFR 20, Appendix B, page 217)..

Table III-1 Indoor Radon and Radon Decay Product Levels[1]

House Location	Approximate Number of Homes	Average Radon Conc (pCi/l)	Average WL	Measurement Conditions	% above .01 WL	% above .02 WL
NY/NJ - EML						
(basements)	18	2.0	.01	YR*	39%	17%
(first floors)	18	1.0	.007		17%	0%
Grand Junction, CO - CDH (background)	29	(1.1)**	.007+	YR	25%	0%
Florida						
(phosphate) - EPA&DHRS	100	(2.5)	0.015	YR	40%	25%
(background) - EPA	29	(0.5)	0.0033	YR	3%	0%
(background) - DHRS	28	(0.65)	0.004	YR	4%	0%
(background) - UF	13	0.8+	0.004+	YR	14%	14%
Butte, MT - EPA & MDHES	56	(3.3)	0.02	YR	75%	38%
Anaconda, MT - EPA & MDHES	16	(2.6)	0.013	YR	56%	25%
Alabama and Neighbor States TVA						
(phosphate slag, first floors)	5	(2.8)	0.017	Jan-May	40%	40%
(phosphate slag, basements)	17	(3.6)	0.018	Jan-May	76%	35%
(control, basements)	5	(2.8)	0.014	Jan-May	60%	40%
San Francisco Region - LBL	25	0.3	(0.002)	Grab D&W Closed++	0%	0%
Energy Efficient Homes (various locations) - LBL	17	4	(0.027)	Grab D&W Closed	76%	35%
Soda Springs, Idaho - IDHW (phosphate slag, basements)	100	1.4+	0.008+	Grab D&W Closed	25%	2%
Illinois - ANL (with unpaved crawl space)	22	6 houses > 10.0 pCi/l of Rn 9 houses > 5.0 pCi/l of Rn		Grab Sample D&W Closed		(41% > 0.03 WL)

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[1] Compiled by Office of Radiation Programs, U.S.E.P.A.

* YR means year round average under occupied conditions (air pump integrated measurements)

+ Geometric mean

** Values in parenthesis are not direct measurements, but are calculated using a characteristic radon decay products/radon equilibrium ratio of 0.5 for basements and 0.61 elsewhere.

++ Doors and windows of structure were closed for a time before taking a grab sample or continuous measurement.

REPORT OF THE TASK FORCE ON RADON IN STRUCTURES, Aug. 15, 1980
RCP-80-002 U. S. Radiation Policy Council

per year for a population of 200 million as a result of exposed tailings without any remedial action. The rate of risk also needs to be put in proper perspective with other risks of fatalities (Table 1). For example, it has been estimated that in a population similar in size to the United States, the risk of premature death is: 670,000 for individuals who smoke; 22,000 deaths for government employees; and, 2,000 premature deaths for individuals who drink 1 pint of milk per day.

Rocky Mountain Energy recommends that EPA proposed rules for inactive tailings establish one standard for WL in occupiable structures consistent with that which is found naturally across the country. A specific concentration of radium-226 in soil and a specific release of radon-222 should not be stated as standards but rather given as guidelines of what limits the agency believes needs to be accomplished in order to meet the WL standard. Further, and most important, this working level standard should be above that which would occur naturally in occupiable structures at a processing site.

According to the proposed EPA regulations (40 CFR Part 192, January 9, 1981), radioactive materials must be disposed of in a manner such that any "underground source of drinking water" is not affected beyond specified limits. Maximum limit for U_3O_8 is 10 pCi/l (approximately 0.0125 mg/l U natural) or baseline condition, whichever is higher. The regulations, however, do not take into account that ground water quality can vary significantly, even over a short period of time due to natural conditions. Data (see attached Table 2) obtained from 14 wells over a 2 year period

Table 1

The following table sets forth a number of commonplace and customarily accepted risks of premature death:

Cause	Individual Risk/Year
Smoker	1/300
Agricultural employment	1/1,700
Motor vehicle - Total (1975)	1/4,500
Air pollution - sulphates	1/6,700
Government employment	1/9,100
Truck driving employment	1/10,000
Falls	1/13,000
Alcohol	1/20,000
Living for one year downstream of a dam	1/20,000
Motor vehicle - pedestrian (1975)	1/25,000
Air pollution - benso (a) pyrene	1/33,000
Drowning (from recreational activities)	1/53,000
Inhalation and ingestion of objects	1/71,000
Home accidents (1975)	1/83,000
Bicycling	1/100,000
Person in room with smoker	1/100,000
One pint of milk per day (aflatoxin)	1/100,000
Accidental poisoning - solids and liquids	1/170,000
Electrocution	1/200,000
Vaccination for small pox (per occasion)	1/330,000
Air travel - one transcontinental flight/yr.	1/330,000

Source: OSHA Testimony of Professor Richard Wilson reprinted in Hutt, Unresolved Issues in the Conflict Between Individual Freedom and Government Control of Food Safety, 33 FD&C L.J. 558, 564-66 & 568 (1978).

TABLE 2

ROCKY MOUNTAIN ENERGY
NINE MILE LAKE SITE
REGIONAL MONITOR WELL DATA*

WELL NUMBER	RANGE IN URANIUM CONCENTRATION
BM -1	0.056 - 0.080
BM -2	0.004 - 0.041
BM -3	0.210 - 0.330
BM -4	0.069 - 0.111
BM -5	0.038 - 0.180
BM -8	0.001 - 0.004
BM -9	0.012 - 0.020
BM -10	0.001 - 0.010
BM -11	0.002 - 0.024
BM -12	0.004 - 0.024
BM -13	0.900 - 1.700
BM -14	0.059 - 0.290
Robb	0.001 - 0.069
Block E	0.001 - 0.140

*Data was obtained in 1978, 1979, and 1980 at Nine Mile Lake Project, 9 miles north of Casper, Wyoming. All wells are completed in a single geologic stratum and are located within 4 miles of a possible uranium tailings disposal facility. Concentrations shown are in milligrams per liter (mg/l).

within the same geologic stratum in the vicinity of a uranium ore body in Wyoming, indicate that the majority of the wells would have violated these requirements due to natural variations even though they had not been affected by mining operations. All wells showed variability in uranium concentrations, with an average difference between maximum and minimum values of 0.119 mg/l (much greater than 0.0125 mg/l). Values observed for a single well varied by as much as a factor of 140 over the same time period.

Since natural conditions cause ground water quality to fluctuate in concentration of radioactive materials, it seems unreasonable to assume that an increase beyond a fixed limit would necessarily be due to disposal activities. RME suggests that EPA develop a ground water standard which takes into account normal ground water variability.

Viability of the Domestic Uranium Industry

The critical state of the domestic uranium industry necessitates revision of federal uranium regulations, and other federal policies which affect the viability of the domestic uranium industry. The need for immediate federal action addressing the current plight of the domestic uranium industry is readily apparent when one reviews the existing and projected state of the industry:

- Domestic uranium exploration activity has been reduced and is not expected to increase in the near future.
- There is increased interest by domestic uranium companies to participate in foreign uranium production.
- Future uranium production is uncertain as a result of substantially increased domestic production costs, depressed uranium prices, and uncertain development of nuclear power in the United States.
- Uranium demand has slipped dramatically since the early 1970's. For example, in 1974 the Department of Energy forecast 102 gigawatts (GWe) nuclear capacity would exist by 1980, yet in that year only 53 GWe was in operation; projections for nuclear capacity in 2000 have slipped five-fold from 1974 forecasts.
- Approximately 5,500 uranium workers have been laid off over the past 18 months. In Wyoming alone, there has been a 36 percent decrease in uranium production employment since May 31, 1980.
- Fifteen of 55 U.S. utilities have contracted for foreign uranium. In addition new long-term foreign supply contracts are presently being negotiated by domestic utilities.
- Foreign uranium resources are substantial and have been growing. In addition, foreign uranium comes from comparatively low-cost production centers.
- Existing federal uranium policies are encouraging the use of foreign uranium which will result in unnecessary and costly dependence on foreign energy resources.

The maintenance of a viable U.S. energy industry is essential to meet domestic energy needs. The Joint Committee on Atomic Energy in 1964 recognized this fact and amended the Atomic Energy Act of 1954 to require the maintenance of a viable domestic uranium industry. Section 161(v) of the Atomic Energy Act of 1954, as amended, provides:

> "to the extent necessary to assure the maintenance of a viable domestic uranium industry",the Department of Energy "shall not offer (enrichment) services for source or special nuclear materials of foreign origin intended for use in a utilization facility within or under the jurisdiction of the United States". (42 U.S.C.A.,Sec. 2201(v), (1973), emphasis added.)

This section clearly provides the authority and responsibility for the federal government to establish uranium policies that will maintain a viable domestic uranium industry. Today, however, domestic uranium producers are faced with two federal policies that directly impede the maintenance of a viable domestic uranium industry. These policies include:

- Federal uranium regulations have the combined effect of increasing production costs and requiring that unusually stringent health standards be met by uranium operations. In addition, some of the existing federal uranium regulations leave no room for domestic uranium producers to design alternative methods of meeting health standards, yet at reduced costs from federally-imposed plans. It is essential that federal regulations stimulate new methods for managing uranium mill tailings, while at the same time, providing reasonable guidelines to protect the public health and safety. We believe this goal can be accomplished if existing uranium regulations are reconsidered by the Nuclear Regulatory Commission and the Environmental Protection Agency.
- Foreign uranium enrichment criteria which promote the increased use of foreign uranium for domestic end use. Given the critical state of the domestic uranium

> industry and the very real threat that by the end of the 1980's the U.S. will rely on meeting fifty percent of its uranium needs from foreign sources, the federal government should immediately amend the DOE foreign uranium enrichment criteria to limit the amount of foreign uranium used in the United States. This action will have an immediate effect on U.S. uranium contracting activity and will provide the incentive for domestic uranium producers to invest the necessary capital to meet future U.S. energy needs.

In order to establish and maintain a viable domestic uranium industry, the federal government should reevaluate and amend existing policies and regulations affecting the domestic uranium industry. Principal problems affecting the industry will not be resolved unless the federal government: (1) establishes a consistent policy to develop nuclear power, and (2) ensures uranium industry viability through revision of federal uranium regulations, and amending the Department of Energy foreign uranium enrichment criteria to limit the use of foreign uranium in the United States. Foreign energy supplies should be used only to supplement, not to primarily meet, U.S. energy needs.

Rocky Mountain Energy looks forward to working with the Congress and the Administration to seek new federal uranium policies that will promote a strong and healthy domestic uranium industry.

SOUTHWEST RESEARCH AND INFORMATION CENTER

STATEMENT BEFORE U.S. SENATE COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS, SUBCOMMITTEE
ON NUCLEAR REGULATON
CONCERNING THE IMPLEMENTATION OF THE
URANIUM MILL TAILINGS RADIATION CONTROL
ACT, PUBLIC LAW 95-604

BY:

PAUL ROBINSON, DIRECTOR
SOUTHWEST RESEARCH & INFORMATION CENTER

JUNE 16, 1981

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INTRODUCTION:

Thank you for the opportunity to appear before the Subcommittee this afternoon. My name is Paul Robinson. I have a Bachelor's Degree from Washington University in St. Louis. I have done Graduate work with Johns Hopkins University and University of New Mexico in Environmental Engineering and Environmental Design. I have taught Environmental Impact Assessment at the University of New Mexico since 1976 and presently direct Southwest Research and Information Center. Southwest Research is an independent, non-profit, public interest research organization providing technical assistance to local communities and others on energy, environmental, and other consumer issues. I have directed a Water and Mining Project at Southwest Research & Information Center, which has focused primarily on the uranium issues in New Mexico and the Western States. My resume is enclosed as Appendix A. I would also add that I submitted testimony to the House Interior and Insular Affairs Committee for its hearing in July 1979 concerning uranium licensing in the agreement states; and this testimony is appended to this document as it relates to several of the questions sumbitted to me by Senator Simpson. See Appendix B. Now I will address Senator Simpson's four questions.

1. The status of efforts by the Agreement States to enter into amended agreements with the NRC by November 8, 1981, to regulate uranium mills and tailings in accordance with Section 274 of the Atomic Energy Act of 1954, as amended by the Uranium Mill Tailings Radiation Control Act of 1978. Given the status of these efforts, whether it is necessary and advisable to extend the November 8, 1981, statutory deadline for the Agreement States to develop amended agreements in order to retain the authority to regulate uranium mills and tailings.

My experience with New Mexico bears most directly with this question of the extension of the agreement state deadline. There are matters of agreement state compliance which existed prior to the Public Law 95-604, with which New Mexico must be compatible. With respect to these older criteria, New Mexico has a poor history of license renewal and operational review of its resident uranium industry. Simply, New Mexico has failed to renew a single mill license in the hisotry of the State's agreement authority. The three largest uranium mill tailings piles in the country, Kerr-McGee, Homestake, and Anaconda, totaling over 60 million tons of tailings, currently operate under licenses which were last renewed in 1971 and nave been pending for renewal since January 1976. None of the original renewal applications made it past the preliminary evaluation stage and the State is now requesting new renewal applications five years later. The other non-renewed license is the Sohio license which ran out in June of 1980; the application was submitted by the operator and little progress has been made on the renewal by the State. The only other license in New Mexico is the United Nuclear-Churchrock license, which comes up for renewal in May 1982. Given the complexity of the licensing action and the fact that the Company has not submitted a renewal application at this time, there is almost no chance that a timely renewal can be conducted for this facility.

Those familiar with the Churchrock facility will remember that the Churchrock Dam had been built in ways different than it had been designed, leaving out valuable seepage detection devices. New Mexico EID didn't know this until the dam cracked for the third and final time, for the State had failed to inspect the Churchrock Tailings Dam as built. This failure to conduct operational inspections is an important flaw in the New Mexico program whether reviewed by criteria existing prior to the Mill Tailings Act or according to current criteria. For more detail on the problems at Churchrock, my testimony before the House of Representatives Energy and Environment Subcommittee on this Churchrock spill is included as Appendix C.

This State has had a historic inability to hire or retain competent staff over time. On June 12, 1981, New Mexico lost its Radiation Protection Program Manager to Sandia Labs. The State's inability to insure competitive professional salaries, coupled with a severe working environment, limit the ability of the State to attract the number and quality of people that the program requires. One should recognize that New Mexico currently has five active mills, two recently licensed mills and two more mill applications and several large insitu mine applications on the books at the present time. At the approximately 2½ person-years per license listed in the NRC Agreement States Approval Criteria, this would require over 20 professional people in the radiation section for licensing alone. Thus, there are serious shortcomings with respect to the New Mexico program before one could consider the equivalence to the Mill Tailings Act standards.

Regarding the Mill Tailings Act and its standards, New Mexico can meet these standards by November 8, 1981, even though there has been a great deal of procrastination on behalf of the State Environmental Improvement Division and other radiation licensing personnel in their effort to meet such criteria. This November 8 deadline is still a manageable one; as a matter of fact, this State just held hearings on June 11, 1981, to fill out its regulatory system with the Appendix A criteria, listed by the NRC as minimal Federal standards required by the Mill Tailings Act. Southwest Research and Information Center's comments on these proposed rules are enclosed as Appendix D.

The NRC rules were published as final in October 1980. New Mexico made no effort to schedule hearings on these rules until March of 1981, at which time Dr. Ted Wolff, Chief of the Radiation Protection Section of the EID proposed that the Environmental Improvement Board hold hearings on proposed language. This language was changed only in superficial ways from that recommended by the NRC in October 1980. It took three months for the New Mexico Environmental Improvement Board to get to hearing from that original March 1981 request for hearing. It is still possible for the State to adopt these rules in time for the development of new revised agreement between the NRC and the State by November 8, 1981. Unfortunately, New Mexico is not trying hard. The Radiation Protection Agency, the Environmental Improvement Division, has proposed these rules for adoption but did not present or defend them at the hearing. The NMEID abdicated that role in favor of the NRC doing that for them. The rule adopting Environmental Improvement Board, even more unfortunately, was not prepared for the hearing. The Chairman had apparently not read the proposed rules under discussion, or heard of the NRC's Final Generic Environmental Statement on Uranium Milling before the hearing. Another member of the EIB had to ask what "the Agreement" was. Such lack of preparation by Division and Board appears to fail minimum federal agreement standards.

New Mexico's Radiation Protection Statutes include another level of decision-making beyond EIB called RTAC--The Radiation Technical Advisory Council. This group must provide advice and consent over Radiation Rules in the State. This double rule-making board system is, in practice, very unwieldy and further complicates New Mexico Radiation decision-making. An employee of Kerr-McGee, the largest uranium miller in the U.S., has the one RTAC slot held by someone knowledgeable on uranium issues.

I believe that it is necessary to maintain this current deadline of November 8, 1981, for several reasons: (1) the State of New Mexico will only respond to a firm deadline and is not inclined to take on an additional regulatory burden, even though mandated by Congress, until the latest possible time. This is because of workload problems in the agency and the political constraints under which regulatory bodies work in the State of New Mexico. (2) The uranium mill licensing programs in both federal and state regulatory systems are only beginning to stabilize after the passage of the Mill Tailings Act. To change these deadlines before they have had a chance to be met is to further confuse and disorient the mill tailings regulatory system. I believe it is straightforward to observe that the most stable entities in the licensing programs are the large firms which conduct the milling operation. The regulatory bodies, both state and federal are considerably more transitory in the personnel and in the mandates under which they operate than the uranium operators. The only entities who further delays in the regulatory systems favors are those operators, in my opinion.

2. The status of remedial action activities under the remedial action program established by Title I of the Uranium Mill Tailings Radiation Control Act of 1978, and whether sufficient progress is being made in carrying out the remedial action program.

There are several relevant observations I can make with respect to the remedial action program concern of the Committee. One is that considerably more money has been spent on exotic disposal technologies such as asphalt emulsion research at Grand Junction than on characterization of the tailings themselves and their potential disposal sites. The asphalt emulsion cover option was eliminated as too expensive in the NRC's Generic Environmental Impact Statement on Uranium Milling. This emphasis on expensive research on engineered covers has resulted in considerably less new research being done on the actual tailings piles themselves, the hydrology and geology of existing sites, and potential new sites. This emphasis on technological solutions has meant that a considerable amount of tax dollars have been spent with little progress having been made in the development of workable solutions to the current problems.

One also finds that the community advisory committees developed by DOE for the remedial programs typically only represent people in the community currently containing the tailings. The fact that these tailings may be moved, and a new place would become the disposal site, appears to have been lost on DOE. As a result, people in Montezuma County, CO. outside Durango, Colorado, and other communities selected for possible disposal, have been somewhat outraged at this failure to be considered early in their local remedial action program.

Additionally, the timeframe for actual remedial action appears to have been over optimistically set, given current funding realities for the program. The seven year sunset on DOE remedial action funding does not appear to be taken into account in the budgetary process. The result is that too little money is being put in at the front end of the program which necessarily stretches out the total timeframe of the remedial effort.

Another area of concern with respect to remedial action program is a probable industry lawsuit filed over EPA's standards for remedial action. With respect to the Title I remedial work, the requirement for EPA standards prior to federal action is much firmer than is the Title 2 active site section of the Mill Tailings Act. Comments by the industry given at EPA hearings in the West and D.C. indicate that the uranium industry will challenge the numerical standards set by EPA for remedial action. Without pre-judging the suit, I believe it is safe to say, such a legal action would further cloud and delay the remedial action program. It is worthwhile to observe that both EPA and NRC arrived at a similar 2 picocurie per square meter per second radon exhalation rate through independent analysis.

As a final point on the remedial action, I have been working with representatives of the Sierra Club out of San Francisco developing a legal approach to insure that EPA and DOE better meet their timetables prescribed in the Act. These timetables, though apparently thought realistic by the agencies in 1978, have turned out to be woefully inadequate. Some pressure to try and meet these deadlines appears to be a responsible action. This encouragement to meet deadlines stands, I believe, in sharp contrast to the extensions being sought by the State and the industry for active sites.

3. Your views on the NRC regulations developed to implement the requirements of the Uranium Mill Tailings Radiation Control Act of 1978, including the economic impact of the regulations, and whether the regulations are practicable, consistent with the requirements of the Act, and appropriate in terms of the need to protect public health and safety.

I believe that the NRC rules are a good set of rules, are clearly workable within current industry practice, and are faithful to the health, safety, and environmental protection concerns of the Mill Tailings Act. The NRC recognizes that numerous facilities, both currently active and proposed, have been licensed in the last two years which substantially meet the requirements of these rules. These facilities include Bokum-Marquez and Gulf-Mt.Taylor in New Mexico, United Nuclear-Morton Ranch and Union Carbide-Gas Hills in Wyoming, and White Mesa and Shootering Canyon in Utah. Because so many facilities have been licensed and, in cases, gone into operation with below grade long-term isolation assured, it is unclear to me what basis the industry has to say is impracticable. The fact is that uranium operators continue to submit license applications meeting the new UMTRCA criteria and continue to have licenses processed and issued, and even go into operation with a slack market. This indicates that; while the industry may complain about new rules, they are clearly workable within the existing industry context.

Public health concerns are, I believe, appropriately addressed in the NRC rules. The concern for covers over tailings piles and a specific numerical limit for a minimum cover -- in this case 3 meters -- unless other materials are proven to be adequate, is an appropriate standard. The primary emission pathways for tailings are long-term erosion or long-term seepage. To only require that radon reduction be met instanteously and not over long periods of time by erosion resistant covers is to not provide the protection required in the Act. The NRC has appropriately addressed the long-term protection concern by specifying a minimum cover layer.

With respect to groundwaters, the NRC has proposed to protect the quality of groundwaters of current and potential use in the Mill Tailings Act mandate to protect from radiological and non-radiological hazards. Clearly, groundwater is a primary area of concern, with respect to the Western United States' reliance on these groundwater waters, including areas with mill tailings piles. Within NRC's mandate to protect health safety and the environment from radiological and non-radiological hazards, groundwater protection must be a basic area for criteria setting. I have prepared comments on these rules as submitted to the Environmental Improvement Board in New Mexico for hearing on June 11, 1981. I have appended these comments on the regulations to this testimony as Appendix D.

4. The relationship between the authority of the Enviromental Protection Agency to promulgate general standards for uranium milling and mill tailings, and the authority of NRC and the Agreement States to promulgate regulations governing uranium milling and mill tailings; the impact on NRC and Agreement State activities of EPA's failure to carry out its standards-setting responsibilities within the statutory time schedule, including the potential for future disruption of the regulatory programs of the NRC and the Agreement States; and whether, in light of this information, EPA's statutory authority to set general standards for uranium milling and mill tailings should be eliminated or modified.

The relationship between EPA's authority to promulgate standards and the NRC's and Agreement States' authority to promulgate the standards in the Mill Tailings Act, I believe, is disposed of quite simply. The relevant section is new Section 84 of the Atomic Energy Act as amended, found at Section 205 of the Mill Tailings Act. Section 84 (a)(1) says that the Commission shall insure that the management of the tailings materials is "appropriate to protect the public health and safety and the environment from radiological and non-radiological hazards..." associated with tailings. In Section 84 (a)(2), NRC is to develop rules for applicable EPA standards, and finally Section 84(a)(3) see that general requirements established by the Commission are concurred with EPA and are compatible with solid waste regulations. Thus, the Commission has a responsibility to insure approprate protection of health safety and the environment from mill tailings hazards, in addition to a responsibility to conform with general mill tailings standards and solid waste standards of EPA. The NRC is presently requiring compliance with the EPA's 40 C.F.R. 190 Standard for uranium facilities. Since there are no other applicable mill tailings standards from EPA at this time, this Section 84(a)(1) "appropriate to protect from hazards" standards of the Commission and Section 84(a)(3) "compatible with solid waste standards" are the relevant authorities under which the Commission can make rules. In addition, Section 84(b) gives the Commisson the authority by rule, regulation or order to "require monitoring, perform remedial work, and comply with such other measures as it may deem necessary desirable to protect health and safety." Thus, the Commission is given authority to conduct remedial action and other rulemaking necessary or desirable for health protection functions independent of EPA action, Section 84(b) appears to give the NRC board authority to regulate uranium operations. Southwest Research and Information Center and National Wildlife Federation have been admitted as amicus parties to the industry's challenge of the NRC's Mill Tailings Act rules in the 10th Circuit Court in Denver. We have made this argument in the court and this brief is found at Appendix E to this testimony.

Because of this independent NRC authority, the EPA's failure to set standards does not affect the Commission's authority to set its own rules. However, EPA's failure to respond to its mandate is a sad comment on their radiation program. Especially, after the optimistic statements of EPA mentioning a six month to one year timeframe to set standards during the pre-passage hearings on the Mill Tailings Act, seeing nothing out of EPA after 2½ years is disheartening. I believe that the Congress is as guilty of setting authorities for agencies and then not funding them to do their jobs, the same problem that arises in agreement states in their legislature processes. Thus, EPA may be able to provide useful standards or useful critique of NRC's program, but has, I believe, missed its opportunity to play a timely role in the development of a mill tailings regulatory scheme. It would be much more appropriate to eliminate EPA's role as an independent standard setter than to allow states two more years to wait before they adopt the NRC's rules.

CONCLUSION:

This concludes my comments at this time on the questions submitted to me by Senator Simpson; given the limited amount of time available to me today, I have tried to summarize key points within very complex questions. I would be glad to respond to questions from the Committee on these specific areas, which I have raised.

Thank you for the opportunity to appear before you this afternoon.

Appendix 4

SOUTHWEST RESEARCH AND INFORMATION CENTER

RESUME: WM. PAUL ROBINSON

BIRTHDATE: April 14, 1953 Resume as of: June, 1981

EDUCATION:

-M. Arch. (all but Thesis)
-Presently enrolled in University of New Mexico, School of Architecture and Planning, Master of Architecture Program, emphasis in Environmental Design. (Coursework emphasizes analysis of natural and modified water systems including irrigation diversions, natural systems and urban flash flood channels and geology).

Graduate Work:

-Environmental Enginnering - John Hopkins University.
(Coursework included water pollution chemistry and water resource engineering.)

B.A.:

-Anthropology, Washington University, 1974.
(Coursework included geology, technology assessment and ecology).

EXPERIENCE:

August, 1976 - Present:

-Environmental Analyst, Southwest Research & Information Center. Work involves technical investigations of the use of natural, human, and community resources in New Mexico. This includes:

-Environmental Impact Analysis;
-Water, land and resource use, assessment and planning;
Testimony before decision-making bodies on Federal, State, and local levels;
-Working with community groups providing technical support on air, land, and water issues;
-Technical research for Center legal proceedings;
-Applications of alternative energy solutions to urban and rural living situations;
-Sediment transport and trace element dispersion analysis;
-Groundwater and surface water discharge and withdrawal monitoring;
-Technology assessment studies of mining development;
-Workshops on groundwater impacts, uranium industry growth and waste water management, mining regulations.

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-Consultant, on water resource quality and quantity for DNA Legal Services, Zuni Legal Services, and Acoma Pueblo, Americans for Indian Opportunity, Northern New Mexico Legal Services, Sandoval Environmental Action Community, Albuquerque District Attorney's Office, Natural Resources Defense Council and Twinings New Mexico Sanitation District, and Minnesota Interim Legislative Committee on Uranium Exploration, Environmental Information Center- Montana, Black Hills Alliance-South Dakota, FARM-South Dakota, Piedmont Environmental Council-Virginia, Atomic Industrial Forum, and National Council of State Legislators.

-Instructor, in Environmental Impact Analysis and Rural Environmental Planning, University of New Mexico. --

January - May 1977:

-Independent research at Technology Applications Center, University of New Mexico.

February, 1975 - June, 1976:

-Associate Project Engineer, ECOsystems International, Inc.:
ECOsystems provides consultant services to NASA, the United Nations and other clients.
Responsibilities include:
-Photo interpretation and landuse mapping from color infrared aerial photograph and LANDSAT imagery;
-Detailed mapping of agricultural land use in U.S. and foreign countries;
-Delineation of Flood Plain topography from aerial photography and LANDSAT imagery and analysis of flood-plain characteristics;
-Analysis of problems and future of septic systems in Anne Arundel County, Maryland;
-Projections of population growth trends into environmentally sensitive regions and their effect in terms of sewage load;
-Statistical analysis of rainfall frequency and duration and streamflow variation to generate watershed models for computers;
-Development of national flood frequency schema;
-Correlation and compilation of crop spectral for use in analysis of ERTS data for crop forecasting and planning;
-Generation and mapping of detailed crop phenologies for U.S. and World;
-Correlation of water, nutrients, temperature and physiological factors into a general characterization of crop growth cycle;
-Evaluation of physiometric change in crops for normal and multi-characteristically stressed environemnts;
-Quantification of the effect of flooding on human and environmental systems for major world river basins;
-Compilation and production of papers, presentations.

1974 - 1975:

-Design Draftsman, Intech Corporation, Charlotte, N.C. Work involved development of specifications and preparations of working drawings for machinery components.

1973 - 1974:

-Anthropological Researcher, Washington University. Data processing and compilation on the following projects:
"Nutrition and Food Consumption in a Rural South Indian Community."

-"Comparison of Housing, Agricultural, and General Settlement Planning and Implementation of the Volta Dam, Ghana, and Kariba Dam, Zambia."

REPORTS AND CONTRACT PUBLICATIONS:

-Environmental Overview of Four Corners Area, University of New Mexico Medical School. Symposium on Reproductive Affects of Mining in the Four Corners Area, Albuquerque, N.M., April 1981.

-Radon and Radon Daughters from Uranium Mines: Sources, Impacts and Controls. Uranium Mill Tailings Management Conference. Proceedings of 3rd Symposium, Colorado State University, Fort Collins, CO., November 24-25, 1980.

-Statement on National Materials Policy before U.S. Senate Committee on Commerce, Science and Transportation Subcommittee on Science, Technology and Space, Washington, D.C., Serial No. 96-122, July 1, 1980.

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-An Analysis of the Draft EPA Ore Mining and Fessing Best Available Technology Report, prepared under contract to Natural Resources Defense Council, 1725 "I" Street, N.W., Suite 600, Washington, D.C. 20006, March 1980.

-Testimony Before the House of Representatives Committee on Interior and Insular Affairs, Subcommittee on Energy and the Environmental Hearings on the Causes and Implications of United Nuclear-Churchrock Tailing Dam Failure, Washington, D.C., October, 1979. Available from Southwest Research & Info. Ctr.

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-New Mexico Uranium Inventory, Southwest Research & Information Center, P.O. Box 4524, Albuquerque, N.M. 87106, May, 1978.

-Comments on the Draft Environmental Impact Statement for Albuquerque Wastewater Treatment Facilities, August, 1977. Available at Southwest Research and Information Center.

-Statement for the Public Record of the Radiation Protection Hearing of January 20, 1978. Copies are available at Southwest Research and Information Center.

-New Mexico Uranium Industry Slide Shows, (1) Overview of technology and environmental impacts, 1977; (2) Development on Indian Land - aerial views, 1978; (3) Impacts of mines and mills - aerial views, 1979; and (4) United Nuclear Churchrock Tailings Dam Break - some aerial views, 1979. (Slides taken and scripts written by Wm. Paul Robinson).

-Statement for the Public Records Regarding Priority List for Wastewater Treatment Works Construction Grants Funds, September 7, 1977. Available at Southwest Research & Information Center.

-Comments on the Draft Environmental Impact Statement for Albuquerque Wastewater Treatment Facilities, August, 1977. Available at Southwest Research and Information Center.

-Problems and Alternatives for the Navajo Indian Irrigation Project. Testimony Before the U.S. Senate Committee on Environment and Public Works, Subcommittee on Water Resources, April, 1977.

-Alternatives for Confined Livestock Operations in the South Valley - Answers to a Community Problem. Copies are available at Southwest Research and Information Center.

-Application of the Dynamic Method of Flood Plain Mapping to Selected Developing Nations. ECOsystems International, Inc., P.O. Box 225, Gambrills, MD. 21054, June, 1975.

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TESTIMONY:

-Before New Mexico Radiation Technical Advisory Council regarding Amendments to New Mexico Radiation Protection Regulations, Santa Fe, N.M., May 1981.

-Before Virginia Coal and Energy Commission regarding Regulations of Uranium exploration. Richmond, VA., May 1981.

-Before the Montana House & Senate Committees on National Resources regarding uranium mining and milling legislation, Helena, Montana, February & March, 1981.

-Before the New Mexico House & Senate Committees on National Resources regarding uranium severance taxes, Santa Fe, N.M., February, 1981.

-In the matter of the Radioactive Material Matter Licenses and Groundwater Discharge Plan for the Gulf-Mt. Taylor Uranium Complex, January 1981.

-In State of New Mexico vs. City of Albuquerque, in the Bernalillo County District Court, No. CU-80-04500, a nuisance complaint concerning odors from an Albuquerque Sewage Treatment Plant, July 1980.

-In the Matter of the Groundwater Discharge Plan for the Ski and Tennis Ranch of Taos, New Mexico, July 1979. Resumed January, 1980.

-In the Matter of the Groundwater Discharge Plan (DP-100) - Bokum Resources' Uranium Mill, January 1980.

-Before the Minnesota House of Reporesentatives Committee on Environment and Natural Resources Informational Briefing on Uranium Mining and Processing, St. Paul, Minnesota, December 1979.

-In the Matter of National Pollutant Discharge Elimination System Permit for Bokum Resources Corporation, NPDES No. NM0028215, December, 1979.

-In the Matter of National Pollutant Discharge Elimination System Permit for Phillips Uranium Corporation, NPDES No. NM0028274, December, 1979.

-Before Royal Commission of Inquiry-Health and Environmental Protection-Uranium Mining Vancouver, Bristish Colombia, Canada. December, 1979.

-In the Matter of Groundwater Discharge Plan (DP-43) - Bokum Resources' Marquez Uranium Mill, May, 1979.

-In the Matter of Amendments to the New Mexico Radiation Protection Regulations, May, 1979.

-In the Matter of National Pollutant Discharge Elimination System Permit for Ranchers Exploration and Development Corporation, NPDES No. NM0026573, September, 1978.

-In the Matter of National Pollutant Discharge Elimination System Permit for Kerr-McGee Nuclear Corporation, NPDES No. NM0020532, May, 1978.

MEMBERSHIP:

-Federation of Rocky Mountain Section Water Pollution Control.

-New Mexico Geological Society.

-American Association for the Advancement of Science.

-American Public Health Association, Environment and Radiological Health Sections.

APPENDIX T5

SOUTHWEST RESEARCH AND INFORMATION CENTER

TESTIMONY BEFORE THE HOUSE OF REPRESENTATIVES COMMITTEE ON INTERIOR AND INSULAR AFFAIRS, SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT HEARINGS ON THE NUCLEAR REGULATORY COMMISION'S STATE PROGRAMS, JULY 19,1979

PREPARED BY: WM. PAUL ROBINSON

P.O. BOX 4524 ALBUQUERQUE NEW MEXICO 87106 505 - 242-4766

My name is Paul Robinson. I am a research associate at Southwest Research and Information Center, Albuquerque, New Mexico, and teach Environmental Impact Review at the University of New Mexico. Southwest Research is a non-profit research and advocacy group working for individuals and groups concerned about various issues, including the effects of New Mexico's and the West's booming uranium industry. We have been involved in these issues for over five years and consider ourselves well-qualified to assess the nation's uranium facility licensing program.

I appreciate this opportunity to submit written testimony to the subcommittee on the subject of NRC's State Programs as they relate to New Mexico. The New Mexico uranium mill licensing program is the largest of the Agreement States programs administered under Section 274 of the Atomic Energy Act. This state program licenses half of the present, and perhaps 60% of the future uranium production in the United States, considerably more uranium production than the NRC licenses. New Mexico is half the production in the United States; Wyoming is approximately 35%; Colorado, Utah, Texas, and Washington make up the last 15%. Only Wyoming and Utah are not Agreement States. The reason to bring the New Mexico State Program to the attention of this subcommittee in this hearing is not that there is an emergency problem as in the American Atomics-Tucson experience, but because there is a routine problem, a routine release from these New Mexico facilities which would not be permitted under an NRC administered program. As I stated before, it is the largest of the state programs administered under the Atomic Energy Act. The total volume of uranium tailings in New Mexico exceeds 70 million tons. Presently, there are five operating uranium mills in New Mexico, three of which each contain between 15 and 25 million tons of commingled uranium mill tailings. There are presently approximately 35 active uranium mines in this state, each emitting large quantities of Radon, a radioactive decay product of uranium. Both of these figures are likely to double or more within the next five to seven years. The recent Overview of the New Mexico Uranium Industry(free from the New Mexico Department of Energy and Minerals)estimates the Radon emission from the existing facilities at over 150,000 curies per year every year. In addition, since 1950, New Mexico has inherited approximately 175 inactive, unreclaimed uranium mines and four uranium inactive mill tailings sites. Within this very large and extensive uranium industry, New Mexico has begun to license these facilities since May 1, 1974, when Governor Bruce King signed an Agreement with NRC which New Mexico would take over radioactive material licensing based on acceptance of regulations which had been adopted in 1973.

Since that time, New Mexico has issued two uranium mill licenses; but has failed to renew four uranium mill licenses, including the three largest tailings piles in the country which I mentioned above--commingled piles of the United Nuclear-Homestake Partners, Anaconda, Kerr-McGee facilities, since those application came in at the beginning of 1976; so it has been over 3½ years. Since those applications were submitted, none have been evaluated and all four of those facilities are operating under licenses first issued in 1971. Suffice it to say, there has been a very large change in the state of the art in mill tailings design, management and regulation since 1971; and none of this new expertise has been incorporated into the licensing and the function of these facilities. New Mexico has been inadequate to the job and unable to take over and accomplish the task that they willingly took on in 1974. Beyond this existing industry, New Mexico has issued licenses for one pilot insitu uranium mine facility and several uranium mill tailings piles backfill operations. In addition, New Mexico is presently evaluating three uranium mill applications, Gulf, Bokum, and Phillips, the sum total of which is over 8500 tons of uranium ore per day capacity-about one-third of the existing United States capacity. There are, in addition, at least three to five new mills expected in New Mexico to feed new mines. This future growth is all slated for the next three to five years. This next three to five years is very important for the growth of the industry and is, as we know, very important to the licensing of uranium mill tailings under the Uranium Mill Tailings Control Act of 1978.

What is the capacity of the State of New Mexico to handle this large, very large, radioactive materials licensing load? Presently, there are three persons on the uranium mill licensing staff in the State of New Mexico Environmental Improvement Division, none of which have more than a year's experience in the uranium mill licensing field. The total experience in the field is less than two years. One of these individuals, the individual licensing the Gulf mill is paid for under the IPA(Intergovernmental Professionals Act) by the NRC; so there are two New Mexico funded staff people. New Mexico is trying to hire new staff people to deal with the new licensing load, but the salaries and work environment which New Mexico offers is not particularly competitive with salaries offered by the industry; as such, New Mexico has a great deal of trouble of attracting the new quality licensing staff. New Mexico had had a licensing staff person since 1974; this individual, Pat Donahue, had testified before this committee last year on the Uranium Mill Tailings Act. He has since resigned his position after the State of New Mexico had issued a "conditional license" to Bokum Resources Corporation saying they could operate their mill if certain conditions were met. As licensing staff, Mr. Donahue felt that he couldn't sign that "license" because he hadn't finished his evaluation. The Agency signed the document and Mr. Donahue resigned. NRC's views were they could not approve the tailings plan for that mill.

The NRC has played a role in the New Mexico licensing program. They have committed to performing technical assistance to the state in the form of tailings management analyses and radiological dose assessments for the State of New Mexico. As yet, these studies have not been completed for the Bokum Resources Uranium Mill, but it is also true that the state has not completed the license application review for that uranium mill. More seriously, while the NRC has copies of applications available for interested citizens and a summary evaluation document, New Mexico has no summary evaluation document and no copies of the plan for citizens' use. Copies are only available at New Mexico Environmental Improvement Division offices. These contraints severely limit the roles citizens and local residents can play in the licensing process. The NRC was in attendance at the Bokum Groundwater Discharge Plan hearing which was held under New Mexico Groundwater Protection Regulations in May 1979, and supplied a technical witness raising issues relevant to the NRC's position on tailings management with respect to groundwater quality. Above and beyond that, NRC has supplied Jim Mackin, who is presently licensing the Gulf Mill. As we know, the NRC had proposed and has begun the process of issuing by-products license under the Uranium Mill Control Act of 1978 for uranium mill tailings in the State of New Mexico as one of the Agreement States. This action, has, I think frankly, angered the Environmental Improvement Division in that they feel that NRC is taking over the responsibility that they have delegated to the State of New Mexico and the New Mexico licensing staff feel is appropriately placed in New Mexico.

There are several aspects of the Uranium Mill Tailings Act of 1978 which bear directly on any discussion of a state program which licenses uranium facilities. Before this Mill Tailings Act, the only licenses issued were mill licenses and all tailings control mechanisms were corollary to the mill licensing process. The Mill Tailings Act says now the by-products licenses are issued for tailings specifically. We find New Mexico's licensing staff saying, well, if NRC takes the by-products licenses, all we get is mill licensing, there is nothing for us to do, we might just as well give it to them since the tailings are the only hazardous part. As a student of mill tailings and uranium industry, I disagree. There are significant aspects of the uranium milling process which require licenses and control both over the worker and general population standpoint, even understanding the point that the tailings are the largest quantity of waste materials, radioactive materials, etc. within the uranium milling operation. Again, mine wastes are not handled yet by either state or federal systems.

Under the Uranium Mill Tailings Act (Sections 201C and 208) the inclusion of mill tailings as by-products materials is effective immediately. Under this guidance, the NRC has elected to license all by-products materials associated with uranium mill tailings in the country, while states gear up their programs to comply with the three year deadline and the rest of the Mill Tailings Act. The states, New Mexico included, feel this is an unwarranted usurpation of their licensing responsibility. Industry feels that the NRC has no role in the state program while states want fiscal and technical support only. My experience shows that the state program, particularly in New Mexico, but also Colorado and Arizona, are all inadequate to deal with the complexities, details, and technical issues related to the uranium mill facilities proposed for licensing in these states. With New Mexico producing half of the uranium mining in the country, as the prime example, the state has rapidly fallen behind with respect to the technology and scale in the licensing of facilities in the rapidly growing uranium industry. Most of this rapid growth is scheduled to be sited, planned and constructed over the next three years. Information from Wyoming, New Mexico, Colorado, Arizona, Texas, South Dakota, Washington State, California, all indicate major new facilities being proposed for operation and thus licensed within the next three years. We are facing a new uranium boom during the three years that the Mill Tailings Act allows the state before they must meet the Act's provisions. NRC has to license by-product materials but not the states. NRC's interpretation that they should issue by-product material licenses in the states is appropriate to fill the gaps the industry and the states are allowing by not wanting to require the Agreement States to issue by-product license and not letting NRC issue them in the interim. New Mexico program is absolutely unprepared to deal with the existing mining load, much less doubling of the uranium mining industry expected by 1985 to 1990. It is already three years behind on the largest part of its licensing load.

The Mill Tailings Act addresses the land ownership of tailings. The question of these tailings sites on Indian lands and tailings sites on lease land are key questions in terms of the long-term management and isolation of these radioactive materials. Low-level radioactive disposal sites are what these tailings piles actually are, and require very long terms of management and control. New Mexico has two facilities being proposed by Gulf Mineral Resources and Bokum Resources which, if licensed now, would be depositing tailings on leased land, land not owned by the operator, the state, or the federal government. In both cases the land will be returned, as far as the license application indicates, to the existing owner with no certainty that stabilization can be accomplished or effective stabilization techniques are even conceivable as in the Bokum case. Bokum wants to put its tailings across a spring fed stream; as yet, the Gulf mill lacks detail for evaluation of the adequacy of stabilization. Both tailings piles will definitely go back to the land owners, and that is a severe problem because we are not sure that those sites will be safe enough to be used. This is exactly the sort of situation for which the Mill Tailings Act has been designed: to insure the radioactive waste can indeed be managed and isolated from the environment by restrictive ownership of tailings. New Mexico's first licensing actions after passage of the Act will violate the landownership sections of the Act.

The next three years are key to the future of the uranium industry and key to showing the people of the nation that radioactive waste can be managed safely. Thus, there should not be a hiatus in requirements of the state to deal with state of the art licensing or requirement for the NRC to stay out of state licensing just because the states have adopted a program, whether it is compatible with NRC program or not. The quality of the program must be the foremost concern. Regular systematic processes to assure a quality program are key to improving the very poor record of radioactive waste management at the front end of the nuclear industry.

The present option to go with what the state and the industry recommend, keeping the NRC out of state licensing programs, deserves discussion. This, in view of my experience in the last several years of uranium mill licensing, would leave the industry in many cases relatively unregulated, especially for existing sites. Only marginal regulation will occur in other cases; and in all cases, the state is susceptible to the very extreme political pressures as the Bokum experience demonstrates. The licensing would not be adequate relative to what NRC requires or could require under its existing criteria; but the license would be to the benefit of the industry which would be facilitated in its licensing of new facilities without respect to quality of life and quality of environment and quality of production for the nation. The costs of poor control at the design stage are much higher than the cost of quality design good licensing requires. It is important to note that in May, 1979, New Mexico held hearings on a proposed amendment to the 1973 Radiation Protection Regulations. The proposed regulations would not comply with the Mill Tailings Act or the existing NRC program, but even so they fought tooth and nail by a host of industry representatives.

The other option, as NRC had proposed it, is that NRC licensing by-products materials for three years and after that time, the states take over the responsibility. I am in support of this proposal. In a letter to Commissioner Hendrie of March 22, 1979, by Denise Fort and myself, we have detailed that position. We haven't supported this position because the NRC is the best licensing agency in the world; there are problems with the NRC programs just as there are problems with various other programs at local, state, and federal levels. But having NRC resources combined with the New Mexico EID will allow the two programs to approach the kind and quality of licensing required to maintain the quality of the environment in the arid west while this mining is going on. The NRC has begun to require, as already noted, mill tailings holders in New Mexico to get a specific by-product license for mill tailings and will prepare an environmental impact statement prior to that licensing action. We feel this process is a great benefit to the State of New Mexico and the nation as a whole by beginning to evaluate both new and active tailings piles now. New Mexico has no summary evaluation report like an EIS.

New Mexico, as I said before, is three years behind on these existing tailings piles, have current licenses to deal with, and no staff to deal with these old piles, the licensing of which is three years overdue. All these tailings piles will be evaluated by NRC. Hopefully, within the three years, an impact statement will be released, a tailings management system will have been developed; and all this in time for the state program to administer the tailings management program rather than the state waiting three years to begin the process giving the big three tailings piles six years of unlicensed operations. These tailings piles are mammoth, some are located across moving groundwater supplies upstream of towns; none are lined to prevent seepage and all are still being added to. They are the worst examples of radioactive management in the United States causing the largest routine emissions into the general population. They are a real black eye with respect to the quality of control in the nuclear industry and will continue to be such until tailings are managed properly. The NRC will begin the process that will establish that control much faster than the State of New Mexico and that in itself is a major benefit of NRC licensing during these three years.

The other option is that NRC continue to supply staffing and technical support as has been the New Mexico experience, but not effect the issuing the licensing or the criteria for the licenses. We feel that this is less than adequate because NRC, as we have found, is playing a major role in the New Mexico licensing experience though it does not have input on the technical criteria for licensing. Granted, NRC in many cases has not been fully prepared on the individual licensing actions which have recently come up. But I strongly feel and I believe that the NRC can comply and should be playing a co-licensing role, at least during this next three year period while the state gears up for a considerably stricter program than it has been using to date.

There are several options which I feel are appropriate to mention as ways to begin to resolve the State-NRC licensing dilemma and I would be more than glad to discuss it in much greater detail with staff and others. The implementation of these programs is vital as it could begin to alleviate the antagonism which has developed between the Agreement States and NRC. NRC could establish local offices in the Agreement States on a permanent basis which would allow the NRC to be very familiar with the licensing role as it is being performed and the individual facilities requiring licenses. Local offices would allow NRC to be up-to-date with the technical and political aspects of the individual licensing actions. As has happened in New Mexico, NRC has not been fully prepared because they have not been aware of current application status with respect to existing licensing operations. A NRC local office would allow local technical evaluation and local administrative evaluation of projects; all of this would be beneficial. In this way, the licensing actions stay in the state which has great advantages for the citizens of the state with whom the Southwest Research works. Leaving the licensing action in Santa Fe makes decision-makers considerably more accessible than in Washington, and were an NRC office available locally, it could cut through the red tape established by the 1500 miles between Santa Fe and Washington.

A second recommendation is that administration of uranium mill licensing be move from the NRC office at State Programs to a technical division, preferably Nuclear Material, SAFETY AND Safeguards(NMSS). This recommendation concerns mill licensing, not whole Agreement States program, since medical, industrial, and other aspects of the program involve much smaller sources and exposures than the mill licensing aspects. Presently, the State Program Office administers the Agreement States programs and has been fulfilling more of an administrative role than a detailed technical evaluation of the adequacy of these Agreement

States. This role is what allowed New Mexico's programs to get so far behind with respect to the operations which they accepted willingly and at its own impetus. Having the administration of the Agreement States out of the State Program Office and in the local offices under technical control would facilitate quality licensing by the NRC and would facilitate quality assistance locally where the assistance is needed. While such a program is being implemented, we recommend that by-products licensing stay with the NRC as the NRC staff proposed. The NRC is more capable of establishing a quality balanced licensing program than the State of New Mexico or the other Agreement States. These states are concerned with very different issues than control of radiation, which the NRC regulations emphasize. Concurrent licensing will diffuse political processes which maximize short-term benefits versus long-term costs. Also, were the NRC to have integrated assistance programs available, potentially in parallel to the EPA proposal, in Senate Bill 1136, the NRC could provide comprehensive assistance to local states while providing technical reviews out of local offices.

In closing, it is important to understand the scale of the programs and the impacts that are being evaluated. Often, Congress is faced with emergency responses which are not in the long run the most critical programs to be evaluated, but have immediate short-term importance to the local constituency. Within this context, New Mexico Agreement State program is a time bomb waiting to go off. It is always cheaper to deal with problems before they become widespread. Now is the chance and there may not be much more time. If the staff or the committee have any questions which arise as a result of this testimony, please contact me at the address on the cover sheet.

Thank you very much.

SOUTHWEST RESEARCH AND INFORMATION CENTER

October 24, 1978

TO: Denise Fort

FROM: Paul Robinson

DATE: October 24, 1978

RE: A Comparison of New Mexico and Nuclear Regulatory Commission Uranium Mill Licensing Programs.

New Mexico's Radiation Protection Regulations are not going to make it to hearing in 1978; no time has been scheduled for 1979 either. No staff and funding can be found to help get the Regs implemented. Industry has been actively attacking regulations already controlling uranium industry sites. These Regulations include many provisions to upgrade the mill licensing program to NRC compatibility; however, since the state incorporates NRC program elements into the Regulations only after Hearings and Environmental Improvement Board approval, this process has delayed adoption of crucial elements of the mill licensing program by New Mexico.

1. The initial, and most striking, incompatibilities between NM and NRC until licensing program are the staffing levels and relative progress on license applications, both renewals and new applications. For background, NM has issued two mill licenses since the agreement between NM and NRC which became effective on May 1, 1974. The Sohio Mill license was issued July, 1975, less than a year after the application was received in September 1974. The UNC-Churchrock Mill was licensed in May 1977, just less than two years after the application was received in July 1975. New Mexico has four license renewals pending--the UNC/Phillips site, the Kerr McGee Mill, the Anaconda Mill and the UNHP Mill--all in the Ambrosia Lake-Milan Area. All of these facilities were first licensed by AEC and NM has yet to issue licenses for these facilities. Each of the applications were received in January 1976 and only the Anaconda Renewal has advanced beyond a preliminary evaluation stage. EID has no apparent jurisdiction over the inactive Shiprock site. EID staff has no idea when these Renewal Licenses will be issued. Gulf and Bokum came in with New Mill Applications in May 1978. Gulf's application has barely been looked at and has yet to be accepted as complete. Bokum's application has been accepted as complete, but has an inadequate tailings proposal. Other questions have been raised as to the adequacy of the Bokum Application. In sum, of the seven mill sites, in the state, only two operate under current licenses. Four, including the three largest tailings pile in the country, operate under eight-year old licenses. Two new applications have been received, and EID expects some eight to ten new applications in 1978 and 1979(see Attachment 1). Two years is the NRC time frame for mill license issuance (two years for the Lucky Mc Mill Renewal from application date to final EIS issuance(October 1975 to Nov. 1977), and two years for Bear Creek, July 1975-application date to June 1977-Final EIS issuance).

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EID's common excuse for the delay in licensing compared to NRC's time frame is the problem of inadequate funding and subsequent inadequate staffing. While this excuse is true, it identifies a weakness in NM EID's ability to build its licensing program to the level needed to work with the present backlog and proposed future licensing action. This is in view of the three year lead time in which the staff had been aware of the new uranium boom. EID's proposed four new Radiation Protection Section Staff people should help alleviate this logjam, but no one knows when these people will come on line. One should also expect at least six months of training before these people are fully functioning. Pat Donahoe, EID's mill application reviewer, resigned effective October 20, 1978, leaving no experienced mill application review staff at EID. As New Mexico looks forward to doubling of its uranium mill capacity, the state has no experienced license review staff.

2. New Mexico produces no Evaluation Document as part of its Mill Licensing Process. Letters and memos are exchanged and a detailed file is maintained, but the EID staff makes no documented summary report before license issuance. This gap has been pointed out in the Weaver and Wilkening, 1978, but EID/RPS has taken no identifiable steps to remedy this situation. The details and documentation of NRC review versus the EID file should be apparent from the NRC tailings and radiological dose reviews expected within the next month on the Bokum Mill. With the $150,000 licensing fee, EID could upgrade its program to include over two staff people per application (at $60,000/staff person). However, EID is not approaching those regulations very aggressively. The lack of a formal review document, comparable to an EIS in range of issues covered keeps the EID program scattered and leaves no formal time frame for decision making. Bokum was able to get a "limited conditions letter" even though one, full staff review had not taken place and two, comments from NM Dept. of Energy and Minerals and SW Research, which raise specific issues not covered in the "limited conditions," had not been forwarded to the applicant.

Victor Gilinsky, NRC Commissioner said in a May 2, 1978 speech, (see Attachment 2). "Whether or not an EIS is legally required for licensing actions in Agreement States, we do believe that a comprehensive independent analysis of the environmental issues is desirable. This is not done in most of the states which regulate mills." Such documentation is more the procedural, it adds substance to the review process both as an assessment process and as an ordered set of events. The non-ordered aspect of the EID process can be identified as one of the EID's short comings in the Bokum situation. The inability to comprehensively address the relevant issues at an early stage let Bokum think they had tentative approval on the alternate tailings dam, the cross arroyo tailings dam. Specifically, Pat Donahoe approved the alternate dam on its construction aspects-use of compacted earth rather than tailings-and not fully considered the long-term maintenance and disruption of natural process performance objectives.

Site Selection Process: A specific area which could be covered in the evaluation document is a site selection review. This element is part of NRC ERs and EISs but has not been a part of NM's licensing to date. This is a particular problem at the Bokum site. Bokum has not even considered a site for which title can be cleared for applicant or eventual government ownership of the site. The NRC site selection process allows for a proper balancing of all relevant concerns rather than the Bokum situation of a selected site which is under construction. This site is being used as an edifice which must be attacked rather than as one of several possible options.

3. NRC urged Agreement States "to consider a prohibition on commencement of major construction activities prior to completion of the environmental review." (43 Fr 17879-82 April 26, 1978, attachment 3). EID plans to prohibit construction of mill facilities to one year after application acceptance or upon issuance of the license, whichever comes first, Draft Rad. Prot. Regs. 3-300. Bokum has 15% completed their mill and tailings piles, neither of which are licensed. The tailings pile will be moved or receive major modifications and the mill should be close to the tailings to reduce tailings transportation costs and hazards. The pressure from Bokum to approve the already developed site will surely increase as the licensing process advances. Of course, Bokum has begun construction at its own risk but can be counted on to use the several million dollars of construction to date as leverage to maintain their presently selected site.

4. In NRC Regulatory Guide 3.8, issued in September 1978, "Preparation of Environmental Reports for Uranium Mills," calls chapter 9 of the ER "Decommissioning and Reclamation." The Bokum Applications chapter 9 is included as attachment 4. It doesn't address mill shut down and decommissioning or compliance with NRC performance objectives. Decommissioning is not specifically mentioned in the "EID Limited Conditions Letter."

5. EID does not require a chapter 11, Cost/Benefit Analysis in its Environmental Reports. This analysis can be the chapter where long-term dose commitment, stabilization, and decommissioning costs come into play. As presently written Bokum only assesses social and capital benefits of the project in its ER. NRC cost benefit analyses are one page superficial statements and not much to compare to. However, this type of analysis can be rigorous and widely inclusive of cost factors.

6. In Science, October 13, 1978, pg. 191, Luther Carter describes New Mexico has having allowed "United Nuclear Corporation to adopt a tailings disposal plan for its mill at Church Rock which is no great improvement on the environmentally unacceptable disposal practices of the past." This tailings pile borders the Rio Puerco above Gallup several miles downstream of the Kerr McGee Mine discharge under NPDES permit and jurisdiction. UNC has also proposed using tailings sands as a structural element in its 2nd stage tailings dam raise. The proximity of the tailings to a stream raises a first question and the tailings in the dam raises a second (I am unsure of the permanentability of the structure underlying the tailings site). The Sobio facility is usually described as a model facility which stands in sharp contrast to the more recent UNC mill. The major weaknesses in the Bokum licensing situation are the conditional agreement before full review, construction before approval, location of the mill at one-half mile from town, and tailings as sited without firmly stated and approved design elements(the unsited diversion dam).

Southwest Research and Information Center
P.O. Box 4524 Albuquerque, New Mexico 87106

TO: Denise Fort
Brian Lysaght, O'Melveny and Myers

DATE: August 23, 1978

FROM: Paul Robinson

RE: URANIUM MILL LICENSING STATUS

The enclosed status report lists most of the present radioactive materials licensing activity of EIA. Others include:

1) The Mobil Crownpoint In Situ Pilot Project. This application was received May 1978 and is being evaluated at present.

2) United Nuclear Mill at Churchrock. This facility's application was received November 30, 1976 and licensed as amendment to UNC-Churchrock Mill.

The progress of the evaluation of these various projects listed on the Status Report as of August, 1978 has been very slow to date with little possibility for major changes shortly. The Radiation Protection Section has one person - Pat Donahue - doing mill application evaluation thought they anticipate hiring several other staff people.

As seen in the Status Report table, the license renewal applications are all two and a half years old. Only the Anaconda renewal has advanced beyond preliminary evaluation. EID sees this as a result of understaffing but also as a result of the lack of the GEIS. EID sees it worth waiting for the GEIS before licensing. EID also has a draft set of radiation protection regulations which have yet to be promulgated. Whatever the reason, the mills--those with the three largest tailings piles in the U.S.--continue to operate without current license provisions. In conversations with EID staff, they have been able to give no projection for completion of any other applications.

There are some interesting developments at the UNC-Churchrock Mill. The operator has proposed a 2nd stage, tailing dam raise using tailings in the dam structure. These tailings are not the sole construction material and are not exposed but they are an essential element in the tailings dam. It is unclear why UNC insists on using tailings as an element in its waste retention embankment.

Hope this is of use. Please call if you have any questions.

STATUS OF NEW MEXICO ENVIRONMENTAL IMPROVEMENT AGENCY REGULATORY ACTIVITY CONCERNING URANIUM MILLING

1.0 Introduction

On May 1, 1974, the Radiation Protection Section of the EIA assumed licensing and regulatory responsibilities for about 100 radioactive materials licenses in the state from the U.S. Nuclear Regulatory Commission (NRC). Four of the licensees included three operating uranium mills and one operating ion-exchange plant (an IX plant extracts uranium from mine waters for further processing at a mill). In addition one inactive tailings pile (the old Phillips mill at Ambrosia Lake) was included in the IX plant license as both are on the same property. Although the old mill and tailings pile are inoperative, they have not been "de-licensed."

The primary objectives in executing the ceded responsibility are employee health and safety and the minimization of the radiation hazard to the general population due to the licensed operations. Historically, the accepted means for acheiving these objectives are a comprehensive licensing process and an extensive, detailed inspection and compliance program for each licensed operation. With the increasing number of uranium mill operations concentrated in relatively small areas (e.g. Grants area) it is now clear that the above regulatory methodology need be expanded in order to achieve the objectives because of the cumulative environmental impact of the many separate milling and mining operations in the area. In addition, several technical and financial problems have been identified concerning the long term control of mill tailings piles which will be radioactive for over 30,000 years. A summary of the EIA's approact to the handling of these problems is discussed below along with a brief description of the State's uranium mill licensing and regulatory activities during the time period that the State has had these responsibilities.

2.0 State Regulatory Activities-Past and Present

2.1 Licensing

Prior to the reception of a license application, the applicant usually requests a conferense with the NMEIA Radiation Protection Section (RPS) staff to insure that all the necessary information will be incorporated in the application. The applicant is also provided with a license application package which contains a description of the licensing procedure, various regulatory guides, and other material that indicates acceptable design and operating practices. A license application package is attached (attachment # 1). A license application usually consists of several volumes in which data relevant to employee and public health and safety and environmental impact are given. A notice is published in various newspapers in the State which invites the public to review and comment on the application. State and federal agencies are invited by letter to review and comment on the application. Within the NMEIA, the RPS evaluates the application, coordinates the evaluations by the Air Quality, Water Quality and Solid Waste Divisions, and incorporates into the evaluation comments from sources outside of the NMEIA. During the evaluation period, many letters, revised applications, reports of studies, etc. are passed between the applicant, the State, and other parties in an effort to assess the acceptability of the proposed operation. Upon a determination by the NMEIA staff that the application meets the requirements of the Radiation Protection Act and the regulations of the NMEIA a license is issued authorizing the operation. The license may and generally does contain conditions and limitations on the activity as deemed appropriate by the NMEIA staff.

The uranium mill licensing activity in the 2 1/2 years since New Mexico became an Agreement state is summarized on table I. One new mill (SOHIO) has been licensed, the three operating mills and the one IX plant are presently in the license renewal process, and another new mill application (United Nuclear Churchrock) is undergoing final evaluation. An application for a new IX plant has been received recently. Mill applications from at least five companies (Phillips, Gulf, Ranchers, Exxon, and Conoco) are expected within the next two years. About 12 requests for mill license application information packages have been received from various engineering and consulting firms which indicates additional license activity in the near future.

2.2 Inspection and Compliance

A mill inspection consists of a tour of the facility (including the tailings area), independently measuring radioactivity at various locations within the mill and at its boundary, checking the company's radiation monitoring and effluent control equipment, a thorough examination of the company's employee radiation dose records and effluent monitoring data (including independent radiological computations as a check on the company's radiological dose calculations), and a conference with the company's management. The inspection is followed up by a letter to management listing items of non-compliance to which the company must respond within a specified period of time describing its corrective actions. The corrective action program is evaluated by the NMEIA staff and communication continues between the NMEIA staff and the company until the non-compliance items are corrected. If the company refuses corrective action or does not carry out the corrective action program in a timely manner, the case is brought before the Environmental Improvement Board for enforcement proceedings.

The actual inspection of a mill requires several days with several NMEIA staff members participating in the inspection. The preparation for an inspection and the resulting follow-up activities generally requires several weeks of staff time with the possibility of more time required if problems are encountered.

It should be pointed out that each mill conducts periodic radiological surveys at various locations within and at the facility's boundary for the purposes of assessing employee radiation dose and verifying that effluents to the environment are less than maximum permissible concentrations in air and water as specified in the NMEIA Radiation Protection Regulations. Records of these surveys are examined by the NMEIA staff during inspections and the accuracy of the surveys checked by making independent samples.

The first state inspection of a uranium mill was the October, 1974 inspection of the Anaconda mill. Five non-compliance items were noted and the company has taken adequate remedial action. In addition the NMEIA conducted a radiological survey of Anaconda's effluent stack and made a radiological survey at the company's fenceline in March of 1975.

An inspection of United Nuclear-Homestake Partners mill was made in January, 1976 and second inspection made in August, 1976. Ten non-compliance items were found. A remedial action plan has recently been submitted by the company and appears to be adequate. Also effluent stack samples were made at the mill by the NMEIA in November, 1976.

The Kerr-McGee mill was inspected by the AEC in October, 1973 and no items of non-compliance were noted. The NMEIA plans to inspect Kerr-McGee in early 1977 as well as the SOHIO mill which recently has begun its start-up process. The United Nuclear IX plant, a low hazard facility compared to uranium mills, will also be inspected in early 1977.

3.0 Problems and Approaches

3.1 Uranium Mill Tailings

The primary problem associated with mill tailings piles is the long-term stabilization and maintenance for as much as 80,000 years (the half life of thorium 230). This problem encompasses not only the technological aspects but also how such stabilization and maintenance is to be financed.

At present there is no recognized method of stabilization that would insure containment for 80,000 years. Both technological and financial problems are presently being investigated in several federal studies [NRC's Generic Environmental Impact Statement (GEIS) for uranium mill operations (see pages 4-6 and Page 8 of attachment # 2), ERDA/Ford, Bacon, & Davis study of inactive tailings piles (Page 2, attachment # 2), other NRC studies are indicated on Page 6, attachment # 2]. The results from these studies should be available in the next few years (the first draft of the GEIS is scheduled to be available in August of 1977) and would be incorporated into the NMEIA mill regulatory process. In the interim, the state of New Mexico is not presently financially protected if a mill operation is terminated and the tailings pile is abandoned without being stabilized. Present NRC licensing practice is to require a new applicant to estimate the cost of stabilization (stabilization by using a 2 ft to 6 ft overburden and revegetation) and a fifty year monitoring and maintenance program. The applicant then is required to post a bond covering these costs (payable to the state in which the mill is located). Until the results of the above studies are available, it is the intent of the radiation protection licensing section of the NMEIA to establish the same practice used by NRC.

3.2 Environmental Monitoring and Control

In November of 1975, at the NMEIA's request, the EPA measured concentrations of radon in the air in the Grants area and found that at several locations the concentrations were in excess of typical background levels. These high concentrations are probably due to contributions from mill tailings piles, mine air vents, and natural sources in the area. The atmospheric conditions in November in that area are considered to be the worst case conditions compared to the rest of the year insofar as radon is concerned. In order to assess overall population exposures, the radon concentrations must be measured throughout the year and comparison made with applicable radiation protection guides. The EPA has indicated that it does not have sufficient resources to conduct such a year-round monitoring program. As a result, the NMEIA is attempting to obtain the resources necessary to establish a comprehensive year-round monitoring program in the Grants area that includes the sampling of radon as well as other radioactive materials. Such a study will be aimed at determining if radiation protection guides are being violated, specification of source terms, and evaluation of population exposures due to uranium fuel cycle activities in the area.

In order to reduce and control the amount of radioactive material in the environment (especially in the Grants area), one must first identify the source terms in the area (i.e. how much of a particular radioisotopic concentration is due to each milling and mining operation and how much is due to the natural background). After the source terms are identified, a new set of regulations may be required in order to equitably reduce the man-made source terms to levels such that the cumulative radioisotopic concentration would not pose an unacceptable hazard to the public. In this regard a special problem arises concerning mining operations which is discussed in the following section.

3.3 Mine Effluents

According to the generally accepted interpretation of the Radiation Protection Act, the NMEIA has no direct regulatory authority over radioactive effluents from mining activities (except for effluents to waterways via the NPDES and ground water regulations). Since the state mine inspector apparently does not monitor or regulate these effluents, these effluents fall into a regulatory "loop hole" area. This appears to be the case on a national scope as well. It is important that this source of effluents be regulated and controlled. The contribution to the overall radon concentration in the Grants area from mine air vents and open pit mines is suspected to be significant. In addition, it is expected that the large quantities of radium will be left in mine water treatment ponds when mining operations terminate. At present, there appears to be no EIA authority to regulate these effluent and residual radioactive materials. The EIA intends to pursue a regulatory vehicle to authorize control over these materials either via the State Mine Inspector ceding authority to the EIA to control effluent and residual radioactive materials, or via a State law or new regulation.

Table I State Uranium Mill Licensing Activity

Company/location	License Application Received	Status of Application	Comments
SOHIO/Valencia Co.	New License Sept. 12, 1974	License issued July 15, 1975	
United Nuclear/ Churchrock	New License July 16, 1975	Final Evaluation Stage	
United Nuclear IX Plant at old Phillips Mill/ Ambrosia Lake	License Renewal Jan. 5, 1976	Preliminary Evaluation Stage ✓ as of 8/78	Request for supplemental information, July 16, 1976. Supplemental information received October 26, 1976.
Kerr McGee/ Ambrosia Lake	License Renewal Jan. 13, 1976	Preliminary Evaluation Stage ✓ as of 8/78	Request for supplemental information in July 16, 1976. Supplemental information received: IX plant - August 1976 Dam stability analysis - Sept., 1976 New evaporation ponds - Nov., 1976
United Nuclear- Homestake Partners/ Grants	License Renewal Jan. 29, 1976	Preliminary Evaluation Stage ✓ as of 8/78	Request for supplemental information, July, 1976 (expect response in Jan. 1977)
Anaconda Co./Milan	License Renewal Jan. 30, 1976	Preliminary Evaluation Stage advanced eval as of 8/78	Report on proposed major change in mill process and increase in production - amendment request received on Nov. 29, 1976.
United Nuclear IX Plant at Churchrock	New License Nov. 30, 1976	Just Received	
BRC	FEB 16, 1978	completeness review completed	
Gulf	May 12, 1978	completeness review in progress	

Appendix [illegible]

SOUTHWEST RESEARCH AND INFORMATION CENTER

TESTIMONY BEFORE THE HOUSE OF REPRESENTATIVES COMMITTEE ON INTERIOR AND INSULAR AFFAIRS, SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

HEARINGS ON THE CAUSES AND IMPLICATIONS OF UNITED NUCLEAR-CHURCHROCK TAILINGS DAM FAILURE

Prepared by Wm. Paul Robinson

October 22, 1979

P.O. BOX 4524 ALBUQUERQUE NEW MEXICO 87106 505 - 242-4766

Members of the subcommittee, thank you for an opportunity to testify before you today. My name is Paul Robinson. I have been an Environmental Analyst at Southwest Research and Information Center, a non-profit organization, for three and one-half years, focusing on mining and water issues. I also teach Environmental Impact Analysis at the University of New Mexico and have, except for thesis, completed a Masters in Environmental Design at the University of New Mexico. I would like to summarize the several causes for the Churchrock spill, and some of its implications for uranium mills and their licensing in New Mexico and the western United States.

CAUSES OF THE SPILL:

The Churchrock dam failed for a combination of design, construction, and operational faults. First, I will summarize various flaws in the design and construction of the dam. The foundation material at the site is not of one type; it was not homogeneous. It has been well-established that bedrock lies below the south end of the dam and alluvial sands and gravels underlie the northern section of the dam. The breach occurred where the bedrock dipped down below the alluvium. Siting is out-dated for good tailings management plans. The waste should be overlying one homogeneous, impervious, structural element to assure stability and eliminate seepage.

The uncertainty with respect to the stability of such a non-homogeneous, underlying system is noted in United Nuclear Evaluation of Probable Cause of Failure Report by Jacobs Engineering and Wahler Associates, August 22, 1979. They say: "During preconstruction geotechnical investigations in 1976, the difficult site characteristics and unfavorable soil properties were recognized." Nevertheless, the company went ahead and constructed this tailings dam at the present site. The second Jacobs and Wahler report, Evaluation of the Integrity of the Remaining Starter Dam, states:

> "Prior to construction of the starter dam, a small dam existed across the arroyo at about station 26+00. This dam was reported to have been constructed by the CCC in the 1930s. Since its construction, the arroyo has silted in and water was piled behind the dam until construction of the starter commenced. Thus, the foundation materials north of station 26+00 were wetter than those south of station 26+00 prior to construction of the starter dam. Saturation and near saturation of the upper foundation materials north of station 26 and particularly north of station 34+00 is evidenced by moisture contents of samples of soil from borings made after the breach occurred."

This indicates that the dam was built on differential foundation rock, not homogeneous materials, and on alluvial material saturated by stock impoundment just described. Both of these design constraints were ignored by the State of New Mexico in its evaluation of the company's siting proposals and indicate long-term instabilities in the dam.

In addition, the Jacobs-Wahler report indicates that there was differential settling not only in the material underlying the dam, but also in the materials composing the dam. The cause of the latter settling was failure to compact the selected dam materials to design density and moisture content.

Kaiser Engineers in a 1976 "UNC Churchrock Tailings Dam Design Report" based on Sargent, Haskins, and Beckwith Soil and Engineering Data, recommended that the starter dam, which is the dam that broke, be used only for a year and one-half before being raised (and also contain the piezometers, alignment monument and five foot freeboard not used). The starter dam at the time of the spill had been used and overloaded 50% beyond its design capacity. It was used for about 25 months rather than 18 months.

In discussing the causes of the accident, we have to understand the differences between what was actually approved in the licensing process and what was actually done by United Nuclear in building and operating its tailings pond.

The UNC Churchrock license application was received in July, 1975; the license was issued on May 3, 1977; the mill operated until the spill occurred. New Mexico does not prepare an environmental assessment, an environmental impact statement, or any form of a summary evaluation document for these licensing actions. The details/specifications of the licensed facility are found in the initial application from the company and the letters exchanged between the company and the state licensing agents. The commitments in those letters are the license condition the company made before it could be licensed; these examples are part of the licensing action. Procedures formulated in those letters include:

--In a February 1977 letter UNC said it would inspect the tailings dam once a day for freeboard adequacy, signs of leaks or breaks, tailings pipe rupture, and diversion ditch obstruction.

--In February 1977, UNC committed itself to inspecting its tailings dam daily and the tailings pipeline once every eight hour shift. UNC also committed itself to semiannual reports on the piezometer-seepage monitor-measurements in the tailings dam. Piezometers are wells built into dams to monitor internal seepage.

--In a March 1977 letter, UNC committed itself to monitoring tailings dam stability. UNC stated piezometers-seepage monitors would be installed in the downstream face of the starter dam and in the tailings dam when raised.

The piezometers were not built into the starter dam, so seepage in the dam was not monitored. No daily or semiannual operational monitoring reports have surfaced in the investigation of the Churchrock spill. According to the 1976 Kaiser Engineers Report, the freeboard at the dam was supposed to be maintained at five feet. Freeboard is the space between the top of the dam and the top of the tailings material. At the time of the dam failure, the freeboard was less than two feet-about 20 inches. The dam had been overloaded to dangerously close to the top of the dam and had no internal seepage control devices.

Aerial photos from March 1978 and May 1979 show that UNC operated the tailings pond so that the liquids were up against the face of the dam rather than a beach of tailings against the dam. This is a key point because once the cracks occurred, the liquids flowed in and eroded further cracks rather than solids flowing in and sealing the cracks. Creation and maintenance of a tailings sand beach to separate the highly acidic tailings liquids from the material in the dam is a basic operational procedure well-known in the tailings management field. No evidence has come out to show UNC ever maintained the sand beach which should be on the tailings pile.

United Nuclear had had cracks in its dam within six months of its initial operation of the facility. Aerial photos from December 1977 and May 1979 submitted to the New Mexico Environmental Improvement Division(EID) after the spill documented these cracks in two sections of the dam. It was well known by the company that the dam was cracking after the first year of operation. The state licensing agencies--EID or the New Mexico State Engineer's Office--were not notified; NRC was not notified; no one knew about the cracks except the company until the dam broke. UNC had filled the cracks with bentonite-a clay which swells to seal cracks; but that is only a band-aid remedy; it didn't identify or fix the causes of the cracks--only filled them in.

Each of this set of steps which United Nuclear failed to take might have itself prevented the catastrophic spill which occurred. Seepage monitors would have provided information as to seepage and structural discharge inside of the dam, but no information was available. The freeboard at the dam showed the overloading of the starter dam and the lack of safety measures. The regular monitoring inspection could have caught the multiple cracks in the dam, but there is no indication that it was done. The combination of these operational failures left the company unaware of the problems within the dam.

THE CHURCHROCK TAILINGS PILE COMPARED TO OTHERS IN NEW MEXICO:

In comparison with other tailings dams in New Mexico, UNC-Churchrock was the most recently built and the most carefully engineered tailings dam in the state. The other active tailings dams are at the Anaconda, Kerr-McGee, United Nuclear-Homestake Partners (UNHP), and Sohio uranium mills. These five active piles in New Mexico represent about half of the United States uranium production. Of these tailings impoundments, only Sohio and UNC are engineered structures. The Anaconda, Kerr-McGee, and UNHP tailings piles are all old style tailings where the radioactive waste is just piled above ground surrounded by a dam of tailings with no structural containment or seepage controls. The seepage below these dams and the releases from these facilities is well-documented by the 1975 EPA, Water Quality Study of the Grants Mineral Belt and summarized in Groundwater, v.14 n5, September/October 1976.

The Churchrock dam was supposed to have been the best, but other piles are disasters waiting to happen. Though massive seepage has occurred, these facilities are still being added to. The United Nuclear, Homestake, Kerr-McGee, Anaconda facilities were up for re-licensing in 1976. The licenses have not been renewed and the companies are still in operation. As a matter of fact, New Mexico has never renewed a single uranium mill license in its history of its Agreement States status dating back to May, 1974.

CLEAN-UP:

The clean up started very slowly; and as a result, most of the contaminated material has been too badly disseminated to recollect. Within two weeks of the spill, there were several rain storms which further distributed the material and made clean up more difficult. Right after this spill occurred, United Nuclear put some of its workers on the clean-up. Six to ten workers had 55 gallon drums and shovels. On August 13, a month after the spill, New Mexico Environmental Improvement Division sent a letter order to United Nuclear saying that the clean up was inadequate due to the small number of people participating. UNC accelerated its clean-up to 30 to 40 people but by mid-August contamination had been widely distributed into groundwater and downstream beyond its critical 75 mile reach. The Rio Puerco, the stream which carried the spill, has a perennial flow from two uranium mines which discharge water into the stream upstream from the Churchrock mill; the flow is about 10 feet wide and the streambed is 50-100 feet wide. The damp streambed could not support the heavy equipment needed to scrape the streambed; thus the bucket-shovel clean-up has been used. As a result of the wet streambed and bucket-shovel operation, only about 0.3% of the total volume of the material spilled has been removed from the Rio Puerco. This does not include any of the volume of contaminated material beyond just the spill volume.

United Nuclear was requested to evaluate diverting that flow so that the streambed could be dried up for heavy equipment removal of the contaminated material. The company responded by arguing that an impact statement would be required, and diversion would be too expensive. They estimated it would cost five million dollars. United Nuclear did not have to prepare an impact statement for the mill itself, and this emergency clean up would not have required an impact statement because it would have been a state order and there is no state impact statement requirement. The five million dollar cost the company quoted for the diversion cost included 3.6 million dollar cost for an all-weather road. Since we are talking about a temporary diversion until the spill is cleaned up, a permanent pipeline or a permanent road are not required.

CONTAMINATION:

According to Environmental Improvement Division data, contamination has become broad at the two foot depth level. (The company is only cleaning up in the first six to twelve inches in its bucket-shovel clean-up.) Indications of increased levels of sulfate at 30 feet depth may signal much deeper contamination. Those 30 foot readings come from Environmental Improvement Division monitoring wells and are the only samples from that deep taken within 100 yards of the stream.

Another area of concern with respect to the clean-up is the company's use of uranium as a chemical indicator of contamination in their assessment of stagnant pools in the downstream reaches of the spill. Of all the materials in the ore, only uranium is removed at the Churchrock mill; that is its job. Thus, uranium would be one of the worst indicators of contamination from the spill. Since the company used uranium, they should not have expected to find any high level contamination in those stagnant pools; and indeed for that reason, they did not clean up those pools at that time. The state of New Mexico took three weeks to indicate to the company that they had used the wrong indicator in their stagnant pool investigation.

RE-OPENING THE MILL:

So far the company has requested to go back into operation using its existing dam. This dam has cracked and failed due to poor design, construction, and operation in the past. The facility has dikes which separate the dam into three main cells; these dikes are built on tailings and are not engineered structures or below grade. The company wants to rely on this already broken dam and these dikes built on tailings to contain its radioactive material even though it has proven itself incapable of operating an impoundment safely or in the way that it had been licensed. UNC has been amassing considerable political support in the State of New Mexico to get back into operation as quickly as possible. The company is losing $100,000 to $200,000 per day in yellowcake production.

The New Mexico State Engineer plays a major role in the reopening of the mill, as the state's dam engineer. Recently, the New Mexico State Engineer appears to have given UNC approval to use the existing site(an unlined borrow pit) for solids and one of the unbreached cells in the impoundment for liquids for about two months worth of additional tailings discharge. The State Engineer's mandate relates to water quantity and impoundment of surface water and does not consider the long-term management reclamation and seepage issues so key to uranium tailings management. Since solids are planned for the pit, not behind the "dam," the State Engineer has no reason to disapprove the temporary permit because only dams, not pits, are within the State Engineer's jurisdiction. But the seepage from that pit and the eventual reclamation of the site are the key parameters from a tailings standpoint. The State Engineer was the EID's engineering expert who approved the failed Churchrock dam, had not known about the cracking in the dam, and had not checked the installation for compliance with the approved design.

I recommend the company not be allowed to operate with above grade tailings disposal. The tailings should go below grade in engineered pits or a combination of pits and mine backfill. In that way, there cannot be a catastrophic failure of the tailings facility as occurs with above grade management such as dams.

It is interesting to note that in the Jacobs-Wahler report, UNC continues to advocate above grade disposal with reinforcement of the broken dam. There is no evaluation of below grade options. The assumption that UNC has to go back to the same dam is incorrect, and has not been compared to a full range of available alternatives. On the other hand, Jacobs-Wahler do provide a fairly full list of alternative failure mechanisms.

Jacobs-Wahler are the consultants used by Gulf Mineral Resources Corporation at its Mount Taylor mill. They had originally designed an above grade dam, part of which was on severely fractured bedrock, for the tailings site, and have recently begun to re-design a fully below grade tailings facility for the Gulf operation. Such re-design is appropriate, if not mandatory, for the Churchrock facility.

COORDINATION BETWEEN ARIZONA AND NEW MEXICO:

Though the UNC mill was licensed in New Mexico, this spill flowed at least 30 miles into Arizona and the stream's sediment transport processes will carry the contaminated material through Arizona toward the Colorado River. There will be limited dilution because we have an ephemeral stream system with rare perennial flows and contaminants will not be spread except in the linear down-stream direction. The spill contained about 40 curies total alpha radiation and about 0.4 curies or 4×10^6 maximum allowable body burdens of Radium-226. Liquids from the spill were seen at Sanders, Arizona. A UNC manager indicates that much of the volume of the spill was lost in a canyon 5-6 miles east of Sanders. Since less than 1% of the volume of the release has been collected, much of the toxic trace and radioactive elements continue downstream and into groundwater. Eventually all of this material will flow through Arizona since it is downgradient. --

Compared to the involvement of the various New Mexico and Federal agencies, Arizona's has been almost non-existent in the investigation of this spill. The Arizona Health Services samples from the time of the spill were mishandled and improperly collected. Only on 25 September did the Arizona Bureau of Water Quality Control grant New Mexico permission to sample Arizona waters. As yet no water quality samples from Arizona waters in the first two months since the spill have appeared and none are expected. The signs which have been posted as warnings against use of the water in the Rio Puerco end at the New Mexico State line. Arizona had no direct input into the UNC mill licensing process; and has not, I don't believe, adequately protected the public health and safety of Arizona people since the spill.

ADEQUACY OF REGULATORY RELATIONSHIPS:

It is important to understand that both Arizons and New Mexico are NRC Agreement States; neither of them collect license fees to pay for the regulation of radioactive materials. The State line has been an impenetrable barrier to information on this spill and to cooperation on tailings management in the southwest. EPA has jurisdiction over the Rio Puerco under NPDES permits issued to United Nuclear Churchrock mine above the mill and the Gallup Sewage Treatment Plant below the mill. The spill went interstate along the Rio Puerco. A month after the spill, EPA issued an order telling United Nuclear that they were in violation of the Clean Water Act for discharging without a permit. They have not enforced a fine on the company even though, by regulation, they are required to levy fines for discharges of pollutants without an NPDES permit. EPA has only asked for initial documentation and has not protected people whose waters have been contaminated by this unregulated discharge. Arizona is in EPA Region IX and New Mexico is in EPA Region VI, another cause for disjointed agency action. The EPA Regions are not coordinating actions though both have contacted New Mexico EID briefly. Despite the two current NPDES permits on the Rio Puerco, EPA's Region VI Administrator has had the record of an NPDES permit adjudicatory hearing on her desk for a year without any action.

The relationship between New Mexico and NRC with respect to radiation protection requires very lengthy discussion which I will try to summarize briefly. New Mexico, which became an Agreement State in May, 1974, has issued two new mill licenses, but has failed to renew any of the four current mill licenses which the State took over after the 1974 Agreement. These facilities are operating under 1971 licenses though renewal applications were presented on time in January 1976. Three and one-half years later, these license renewal applications are still in a preliminary evaluation stage. New Mexico does not prepare an environmental analysis or any summary document of its uranium mill licensing action, has no public participation provisions in its licensing procedures, and does not receive enough copies of documents to distribute to interested parties. Even so, New Mexico EID has been considering a suit against the NRC for taking concurrent jurisdiction during the implementation period of the Mill Tailings Act. Such concurrent jurisdiction is appropriate and desperately needed for orderly growth of the industry and for health and safety reasons. Though New Mexico's licensing staff has good people, the staff is much too small for their enormous task. In a mining state like New Mexico, the state legislature is not likely to adequately fund the regulator of the fastest growing industry in the state.

It is appropriate to keep the licensing decision in New Mexico for access by local people, but a major NRC technical support role is required. We feel that there needs to be firm detailed commitments from the NRC as to exactly what kinds of technical assistance will be provided on a multi-year basis so that we are not just talking about "technical assistance" generally, without knowing what is actually coming. New Mexico needs to know in detail, both monetarily and with respect to human resources, how much can be expected from NRC and when. Such a detailed technical assistance agreement should be the basis for authorizing an Agreement State's operation and should be subject to formal annual compliance reviews by the agencies involved and the public. There has not been a detailed compatibility review on the New Mexico and NRC Agreement. Such a review should be conducted for New Mexico, and the other Agreement States before they are allowed to operate as NRC Agreement States after November 8, 1981, the date of implementation of the Atomic Energy Act.

ENFORCEMENT:

As a final recommendation, the Regulations have no weight without an actual, coherent enforcement program. In this instance NRC has no method to enforce the requirements of an agreement with the Agreement State, such as New Mexico, or with the individual licensees within the States. In addition, the State has no mechanism to enforce compliance with its licensing actions. New Mexico lacks the enforcement capability of the construction phase during routine operation and in response to catastrophic events. An "as built review" must be implemented to ensure that the design approved in the license is actually built. On-going operational control, via routine and surprise inspections and regular operational reports from licensees need to be instituted so licensing agents can have a firm grip on what is being operated and how. This enforcement framework must include mandatory penalties as a mechanism to ensure enforcement of the law within a regulatory system which has been more responsive to lobbying and short-term political concerns, rather than long-term health and safety. The NRC must improve its system so that actual enforcement of the law can be accomplished and must require an effective enforcement program before authorizing continued agreement state licensing.

That concludes my prepared comments. If you have any questions or comments, please contact me at the address on the cover sheet.

Thank you.

SOUTHWEST RESEARCH AND INFORMATION CENTER

STATEMENT FOR THE RECORD ON THE PROPOSED AMENDMENTS TO THE RADIATION PROTECTION REGULATIONS, JUNE 11, 1981

BEFORE ENVIRONMENTAL IMPROVEMENT BOARD, GEORGE H. HENSLEY, CHAIRMAN

BY

PAUL ROBINSON, SOUTHWEST RESEARCH & INFORMATION CENTER

JUNE 11, 1981

P.O. BOX 4524 ALBUQUERQUE NEW MEXICO 87106 505 - 262-1862

INTRODUCTION:

This statement is intended to support the rules under consideration at this hearing. These rules and their intent are well within the statutory mandate of the New Mexico Radiation Protection Act and the Federal Atomic Energy Act as amended by the Uranium Mill Tailings Radiation Control Act of 1978. The recent licensing of the Gulf-Mt. Taylor Mill and Tailings Facility shows that these standards can be met by New Mexico operators at this time. Experience in other states shows that facilities have been licensed under these new standards for new operations and for renewals of existing operations. These standards are both practicable in industry experience and based in statutory language. We would request that the Environemental Improvement Board include the record of the Radiation Technical Advisory Council meeting of May 28, 1981, in their record of discussion for these particular Appendices as considerable amount of testimony was forwarded at that time by operators, NRC, and the Southwest Research and Information Center on these rules. These comments will continue with a discussion of individual sections proposed for consideration and adoption by the Board.

SECTION 3-300-M:

This section applies the requirements of the Appendix A to Part 3 of the N.M. Radiation Protection Regulations to existing mill licensees at the first renewal or within nine months from effective date of this Appendix. This concern for existing mill compliance with the new criteria discussed in the Appendix to New Mexico Radiation Rules is proper under Section 202 of the Uranium Mill Tailings Radiation Control Act of 1978. This has been recognized by the Nuclear Regulatory Commission in their insistence that existing operations comply with Mill Tailings Act requirements, in addition to new licensees. Experience in Wyoming and Colorado where the Union Carbide-Gas Hills and Cotter Corporation-Canon City Mills respectively have received renewal licenses while substantially meeting the new requirements of the Mill Tailings Act. These requirements are thus demonstratably practicable given current industry practice. Further, this section only requires the mill licensees to submit documentation and does not require compliance with these new Appendix A rules within nine months of effective date of these appendices. Therefore, it is still up to the state to evaluate this documentation and determine compliance schedules. That determination will be made after the renewal application is submitted and not within nine months of the effective date of this Appendix.

SECTION 3-300-N:

This section requires facilities to operate within a limited exposure to the nearest member of the public as part of their license conditions. This is an application of EPA's 40 C.F.R. 190 standard and is also a requirement by the NRC for equivalence under the Mill Tailings Act by November 8, 1981. This 40 C.F.R. 190 standard exposure criteria was met by both the Bokum and Gulf Mill license applications in New Mexico and has been met by numerous licensees in other states. Thus, this standard is also demonstratably practicable in New Mexico and has not required major revision in license applications or the denial of any particular license applications. It is important to note that this 3-300-N standard specifically excludes, radon and its daughters, commonly considered the radioactivity of highest potential risk to nearby populations from the uranium mining and milling sector.

APPENDIX A, CRITERION 1:

Criterion 1 requires the operators of existing facilities or proposed operators of new facilities to evaluate several alternatives to tailings disposal plans with respect to remoteness from population, surface and ground water conditions, and the minimization of potential erosion and disturbance by natural forces. This mandate for consideration of alternative tailings plans based on a facility's ability to reduce exposures and isolate tailings is a basic concern of the Uranium Mill Tailings Radiation Control Act. The three criteria for selection for alternative sites need to be balanced so that one is addressing all three criteria and not simply one. In this way compromise and trade off processes can play a role in tailings licensing. Therefore, the site selection process as characterized in Criterion 1 is an optimization of a site with respect to these factors and provides a measure of good design practice for the site selection stage. This criteria emphasizes the importance of siting features to provide long-term control of tailings' hazards rather than emphasizing engineering features. This is, again, appropriate within the long-term concerns addressed in the Uranium Mill Tailings Act. Materials disposed of under the Uranium Mill Tailings Act are to be transferred with few exceptions to the states or federal government without costs to the states or federal governments. The concern for disposal with no active maintenance required to preserve stability of the site is appropriate under the Mill Tailings Act and attempts to reduce the costs of maintenance to the very minimum for tailings transfer to state or federal government authorities.

CRITERION 2:

This criterion addresses an effort to avoid proliferation of small waste disposal sites and consolidate perpetual surveillance obligations. The thrust of this criterion is to consolidate tailings disposal facilities for ease of monitoring over the long term. This consolidation is to be encouraged, but is not mandatory. Use of small sites can be approved if consolidation is demonstrated to be impracticable or the advantage of small-scale, on-site disposal outweigh the benefits of reducing perpetual surveillance requirements. Thus, though the proliferation of small sites is discouraged, a showing that there is no excess risks associated with these small sites is the criterion's mechanism for allowing on-site disposal for small bodies of waste. This, is again, an appropriate way to state a criteria and requires the operators to meet this criteria unless they can show that it is not beneficial.

As insitu technology expands in the uranium industry, with the, for example, Mobil applications in the Crownpoint area, this small disposal site question will become more and more important. To address the concern in the matter described in Criterion 2 is appropriate, workable in other states, and provides flexibility.

CRITERION 3:

This criterion addresses disposal of tailings below the original ground surface or below grade as the prime option for tailings disposal. This criterion includes disposal in mines and specially excavated pits as within the broad category of below grade. This criterion also includes the evaluation of alternative sites (Criterion 1) and requires the consideration of below grade disposal in the alternative study. This criterion permits non-below grade options if the below grade is found to be not practicable, but the above grade disposal can only be approved if it is demonstrated that this program will provide reasonably equivalent isolation of the tailings as below grade. Thus, the prime option is not a mandated disposal format, but can be varied upon a showing that erosion and isolation can be accounted for in the above grade design. Indeed, the below grade has not been selected in the Cotter-Canon City re-licensing conducted by Colorado based on a showing that below grade was not practicable and Gulf-Mt. Taylor in New Mexico was approved with an above grade liquid disposal pond accompanying a below grade solids disposal site.

In summary, the below grade option is a prime option as demonstrated by the Generic Environmental Impact Statement on Uranium Milling and is a practicable option as shown by the recent licensing of both Gulf and Bokum in

New Mexico. It is not the sole solution for tailings; but is the criteria by which new facilities or renewal of old facilities should be measured, but not limited to.

CRITERION 4:

This criterion addresses the site and design parameters by which tailings disposal, whether above or below grade, should meet, including reduction of up stream catchment, wind protection, minimal erosion potential, a vegetated cover or rock cover on a reclaimed pile, specifications for rock cover and slopes of reclaimed surfaces, avoidance of potential geologic faults, and the ability to encourage deposition ofmaterials to increase cover at the site. All of these apsects of Criterion 4 provide parameters within which facilities are to be designed. These criteria, in general, encourage operators to minimize mechanisms which can disperse tailings or destroy impoundments for those tailings. Because Congress, in its adoption of the Mill Tailings Act, was concerned about long-term isolation of tailings, these criteria have been developed as key parameters in the long-term isolation concern. Clearly, the Criterion 4 parameters are more difficult to meet with an above grade rather than a below grade disposal program. Conversely, many of these criteria become very straightforward, less costly, and easier to meet when tailings goes below grade and are difficult and expensive to meet with above grade options. These criteria are phrased in such a way as to encourage good performance or minimize the destructive forces in nature and do not provide unequivocable numerical standards. This is appropriate in that the criterion should define parameters within which designs can be proposed and not limit the range of designs available. The recent Gulf and Bokum decisions did allow licenses to be issued within six months of submittal of final design and gave extensive consideration to many of these Criterion 4 concerns.

CRITERION 5:

This criterion addresses groundwater protection with respect to mill tailings and their properties, including the toxic materials commonly found in these tailings. The criterion addresses existing groundwater supplies and their current or potential uses and does not allow deterioration of existing supplies from their current uses; but it may allow degradation of water quality within those use categories. To meet this groundwater protection criteria, six specific areas are addressed, including installation of liners, mill process recycle, dewatering of tailings, neutralization of contaminants, and characterization of soils, geology, and the waste solutions. These areas are currently of major concern in mill licensing and have been addressed in each of the recent applications submitted to New Mexico for licensing, and thus, are quite conventional questions to be addressed by license applicants. They represent in no way an additional burden on mill licensing applicants. The Criterion 5 specifies certain tests to verify whether groundwater protection has been achieved; and this again is a basic concern of current licensing authorities--to not only approve design, but to verify that the designs have been operated in the way in which they have been approved. Criterion 5 is also comparable to the N.M. Water Quality Act Rules which protect groundwater of reasonably forseeable use.

CRITERION 6:

This criterion requires a minimum level of excess radon emitted from tailings of 2 picocuries per square meter per second above background and not less than 3 meters of earth cover to be placed over tailings or wastes at the end of milling operations. This 2 picocurie standard is defended in the Generic Environmental Impact Statement on Uranium Milling, available in the EID office, and can be obtained with--depending on the soil--anywhere from 2 to 5 feet of cover. This additional cover up to the 3 meter or 10 foot standard is required because of concerns for long-term erosions. This criterion is one of the more controversial with respect to the industry's position and it is because this 3 meter cover is seen as unduly restrictive. However, if one calculates erosion from an above-grade site, one will find that the 3 meters is a very short term cover, considering the thousands of years lifetime of hazard from the tailings. The 3 meters of soil are easily obtained on site when tailings go below grade as this cover can come from the excavation of a below grade site. This has been demonstrated with both Gulf and Bokum where below grade disposal facilities have been approved with covers ranging from 20 tO 50 feet, considerably thicker than the 3 meter minimum. If one adopts mine backfill, that is disposal of tailings in the corridors of the mine below ground, then there is no additional cover required for there will be several hundreds of meters covering these below grade materials if mine backfilled.

The emission limitation of 2 picocuries per square meter is easily obtained with soils as shown in the Generic Environmental Impact Statement; and this Criterion 6 does allow non-soil materials to be used to cover tailings to less than 3 meters. This reduced covering can be allowed only if there is a demonstration that such materials will not degrade or weather over long-term intervals. It is these long-term intervals that require 3 meters of cover; and thus, to go less than that requires a showing of the ability to meet that long-term erosion concern.

CRITERION 7:

This criterion addresses the pre-operation monitoring data, which is used to evaluate the baseline levels at a site. It is appropriate to require this baseline data for a full year so that one is able to understand the variations of the annual cycle on background levels; and it is appropriate to require this background monitoring before major site construction. In that way, background can be identified before major impacts of an operations rather than after disturbances have already been made. The continuation of the operational monitoring program through the construction and operation phase is specified in this criterion and has also been specified in NRC Regulatory Guides for the past several years. This operational phase monitoring is important to verify changes which may or may not occur as a result of an operation at the earliest possible time and to monitor performance of a facility based on a representation in a licensing program. These monitoring programs are in line with current licensing conditions and do not represent a burden beyond that already carried by New Mexico mill operators.

CRITERION 8:

This is a criterion which addresses the reduction of airborne effluents from mills to as low as reasonably achievable--a phrase which is standard in the health physics field. This as low as reasonably achievable release is set with respect to emissions from tailings as well as from the mills themselves. The ability to control dust is a long-standing concern of the New Mexico Radiation Protection Bureau and has been a requirement of recent Bokum and Gulf licensing. Both Bokum and Gulf were licensed without major excess costs from airborne effluent reduction. Both licenses will reclaim their waste as its mill operates.

The requirement of operators to monitor airborne emissions under Vriterion 8 is certainly appropriate. If one is to be able to understand the levels of emissions from these facilities, monitoring must be conducted.

CRITERION 3A:

This criterion addresses the daily inspections of tailings or waste retention facilities by qualified operator representatives. This concern for daily inspection is a low-cost, on-site inspection conducted by people familiar with the facility which is a basic concern, which unfortunately had not been conducted by such operators in New Mexico as United Nuclear at Churchrock. This requirement for daily inspection has been recently implemented by the Environmental Improvement Division and the State Engineer's Office with respect to current waste retention systems and does not represent an additional burden for operators.

CRITERION 9:

This criterion addresses financial surety araangements. The specific kinds of surety offered, include five different kinds of surety, along with any "other" category which allows for any form of assurance except for self-insurance. These surety criteria have been met by licensees of current mills in Utah, Washington State, Colorado, and Wyoming; and thus, they are demonstratably available for the uranium industry in the West. The prohibition against self-insurance is discussed in some detail in the Generic Environmental Impact Statement and is simply to provide a specific line of credit for the reclamation facility, other than a generalized format such as self-insurance.

The ability of the operators to get financial surety has been demonstrated in other states and is practicable in New Mexico which operates under similar restraints. Obviously, one needs to have a specific plan which is insured or protected by surety with a specific cost range in order to evaluate whether a surety firm will provide coverage. Merely giving an insurance firm the rules and asking if this rule would be bonded, is not likely to get a satisfactory answer, as demonstrated by kerr-McGee at the Radiation Technical Advisory Committee meeting in May, 1981.

CRITERION 10:

This criterion summarizes the various parts of the New Mexico Radiation Rules, Parts 1, 3, 4, and 12, which are directed to the operators at the close of their active phase. Criterion 10 requires that the final disposal of tailings be in a manner that does not require active maintenance to preserve isolation. This similar concern has been addressed in the New Mexico Radiation Protection Act in the section on Continued Care Fund where New Mexico is given authority to adopt these reduced type of maintenance conditions, separate and apart from Federal Mill Tailings Act requirements.

CRITERION 11:

This criterion requires that tailings be able to be transferred to the ownership of the state or federal government at the time of licensing, though the transfer does not need to occur until the termination of the license.
It is at the initial licensing stage that one needs to evaluate whether this transfer can or will be accomplished. This transfer is required in all cases except those under Criterion 11C where on-going surface surveillance would not be required and land ownership will not protect the public health and safety. This allows for the deep mine backfill option, which is currently in place in

some New Mexico operations without requirement to transfer land under which tailings has been disposed several thousand feet down. This land transfer section makes exclusions to transfer Indian lands as well and thus is not able to be used as a taking of Indian land.

SUMMARY:

These brief comments were prepared in order to aid the Board in understanding the ways in which these proposed Amendments may effect current and future New Mexico mill operators with respect to their additional costs and the reasonableness of the burdens imposed by these Amendments.

In conclusion, we believe that the rules themselves are in line with the Uranium Mill Tailings Act, are not unduly restrictive of New Mexico operators, have been met by recent New Mexico licensees and renewals and new licensses in other states, and thus are demonstratably practicable in today's uranium market.

Thank you for the opportunity to appear before you today.

BEFORE THE ENVIRONMENTAL IMPROVEMENT BOARD

MEMORANDUM IN SUPPORT OF PROPOSED ADDITIONS TO NEW MEXICO RADIATION PROTECTION REGULATIONS

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I. INTRODUCTION:

These comments of Southwest Research and Information Center are restricted to the amendments proposed to the New Mexico Radiation Protection Regulations to achieve compliance with Nuclear Regulatory Commission (NRC)requirements. As indicated in previous correspondence with the Environmental Improvement Board (EIB). Southwest Research & Information Center (SRIC) believes that additional state regulation is necessary to adequately protect public health and safety from the hazards of uranium mining and milling. The SRIC's proposed additional rules will be presented at the EIB hearing on June 12, 1981.

The Uranium Environmental Subcommittee of the New Mexico Mining Association presented the Radiation Technical Advisory Committee (RTAC) with 40 pages of testimony at RTAC's April 17 meeting. The UES is expected to make essentially the same arguments at today's hearing. The industry testimony, however, is based on a misinterpretation of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA) and the authority of the EIB, and is not relevant to the issue before the EIB. Given the need to adopt effective regulations and the limited time for review, it is essential that today's hearing focus on the issues which must be decided.

II. UES' PROCEDURAL ARGUMENTS:

The industry challenge to the proposed amendments is both procedural and substantive. As a matter of procedure, the industry argues that the EIB should not consider the proposed amendments because the industry has (a) filed a motion to stay implementation of NRC regulations, and (b) challenged in Federal court the NRC's authority to impose licensing requirements until EPA promulgates certain standards under the UMTRCA (p. 2 UES letter of April 14 to RTAC).

Section 204 (h) of UMTRCA (PUB. L. No. 95-604) requires the state to adopt rules which comply with NRC regulations by November 8, 1981. The legal force and effect of the NRC's regulations is not changed because a motion to stay their implementation is filed or because the authority of the NRC to issue them is challenged. Should an adequate state program not be established, regulatory control will revert automatically to the NRC.

The ruling on the industry's legal challenges cannot be predicted. It would be unreasonable and irresponsible for the Board to presume the stay motion will be granted or the regulations invalidated. As long as the NRC regulations are in effect, the EIB is required under UMTRCA and its agreement with the NRC to maintain an equivalent state regulatory program. A failure of the Board to proceed expeditiously and adopt conforming amendments would violate the state's duty under UMTRCA and jeopardize New Mexico's authority to protect its citizens from the hazards of uranium milling and tailings.

This hearing is not the appropriate forum to consider the substance of the industry's challenge to NRC authority because of the absence of EPA standards. Only the Congress or Federal courts, not the EIB, can determine the validity of the NRC's regulations. Should, however, the EIB wish to examine the industry's claim in greater depth, the following excerpt from an amicus brief submitted by SRIC and the National Wildlife Federation in opposition to the industry challenge demonstrates that the claim is without merit.

> Section 84 (a) (2) of the AEA requires the Commission to insure licensee conformance with "applicable general standards" to be promulgated by EPA. (UMTRCA, Pub. L. No. 95-604, Sec. 205.) However, no such general standards have been promulgated, none are on the immediate horizon, (EPA now believes that final standards will not be in effect until April of 1983, (46 Fed. Reg. 23697, April 27, 1981), and none are therefore "applicable." Nothing in Section 84 indicates that the Commission's authority under Section 84 (a) (1) is in any way contingent on the EPA regulations referred to in Section 84 (a) (2). Even were the statute to be read in such a tortured manner, Section 84 provides that "(n)othing in this section affects any authority of the Commission under any other provision of this Act. (UMTRCA; Pub. L. No. 95-604, Sec. 205 (a). The Commission's more than ample authority under Sections 81 and 161 (b) of the AEA would therefore be utterly unaffected even by the reading of Section 84 most favorable to petitioners.

To summarize, today's hearing should be restricted to testimony on the merits of the proposed amendments. The EIB has no authority to determine the validity of the NRC regulations and cannot postpone its legal obligation simply because some aspect of the Federal program is subject to legal challenge. Any testimony urging such action is not relevant to this hearing and should not be admitted.

III. COMMENTS ON PROPOSED AMENDMENTS:

Section 74-1-9 of the New Mexico Environmental Improvement Act identifies the following factors, which must be considered by the EIB prior to adopting regulations:

> (1) character and degree of injury to, or interference with health, welfare, animal and plant life, property and the environment;
>
> (2) the public interest, including the social, economic and cultural value of the regulated activity and the social, economic, and cultural effects of environmental degradation; and
>
> (3) technical practicability, necessity for and economic reasonableness of reducing, eliminating or otherwise taking action with respect to environmental degradation.

SRIC believes a proper weighing of the factors strongly supports adopting the propsed amendments as the minimum program necessary to protect the public interest. Paul Robinson of SRIC will testify in detail, and provide written comments, with respect to the technical and economic practicability of the proposed amendments.

In evaluating the Section 74-1-9 factors, the EIB must also consider that the regulations adopted must comply with NRC requirements. The Atomic Energy Act (AEA) 42 U.S.C Sec.2021 (o)(2) now requires agreement states to adopt standards "which are equivalent to the extent practicable, or more stringent than, standards adopted and enforced by the Commission." (Pub. L. No. 95-604). The proposed amendments are necessary to make the states' program equivalent to the new NRC regulations.

The industry maintains that meeting the requirements of the amended program would be uneconomical and therefore "impracticable." The industry asks your Board to adopt less stringent standards, although, since no alternative language is proposed, it is impossible to say what those standards might be. The industry's argument is based on a misinterpretation of UMTRCA and the NRC's implementing regulations. The EIB has no authority to adopt standards less stringent than the NRC standards.

The Atomic Energy Act (AEC) makes clear that the NRC has final authority to determine what level of regulation is practicable for a state to achieve. In the Generic Environmental Impact Statement on Uranium Milling (GEIS), the Commission declares its regulations to be the minimum practicable standards necessary to constitute an equivalent state program. On Page A-91 of the GEIS, the Commission specifically interpreted the Atomic Energy Act "to mean that in all cases, standards imposed by the states must be at least as stringent as standards imposed by the Commission." (Original emphasis). The EIB has no authority to substitute its judgment of what standards are practicable for the NRC's judgment of practicable standards.

Finally, it should be noted that even if the EIB had the authority to adopt less stringent standards, the industry's allegation of impracticability cannot be supported. Paul Robinson will comment specifically on the practicability of the proposed regulations and demonstrate that the requirements can and are being met.

Effective control of the hazards of the uranium fuel cycle is long overdue and prompt action is necessary to protect the health and environment of the people of New Mexico. The proposed amendments represent an important step in establishing an adequate regulatory program and we urge their adoption.

Respectfully submitted,

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APPENDIX I

UNITED STATES COURT OF APPEALS

FOR THE TENTH CIRCUIT

KERR-McGEE NUCLEAR CORPORATION,)
et al.,)
)
Petitioners,)
) CA No. 80-2043
v.)
) AND CONSOLIDATED CASES
NUCLEAR REGULATORY COMMISSION,)
et al.,)
)
Respondents.)

MOTION FOR LEAVE TO FILE MEMORANDUM OF *AMICI* IN OPPOSITION TO MOTION FOR STAY PENDING REVIEW

The National Wildlife Federation and Southwest Research and Information Center hereby move the Court for leave to file a Memorandum in opposition to Petitioners' Motion for Stay Pending Review. Petitioners' Motion raises questions of serious public concern. Such a stay would adversely affect *amici*, their members, and other members of the public, and should not be issued absent a much stronger showing of likelihood of success on the merits than that made by petitioners. *Amici* therefore request leave to state their position to the Court in the attached Memorandum.

Amici note that their memorandum is 23 pages in length, and assure the Court that they have worked diligently to condense their memorandum in the time available, *amici* not having been served with the Motion for Stay Pending Review or supporting Memorandum until some time after its filing.

Amici therefore pray the Court to accept their attached memorandum.

Respectfully submitted

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UNITED STATES COURT OF APPEALS

FOR THE TENTH CIRCUIT

KERR-McGEE NUCLEAR CORPORATION,)
et al.,)
)
Petitioners,)
) CA No. 80-2043
v.)
) AND CONSOLIDATED CASES
NUCLEAR REGULATORY COMMISSION,)
et al.,)
)
Respondents.)

MEMORANDUM OF *AMICI*
NATIONAL WILDLIFE FEDERATION
and
SOUTHWEST RESEARCH AND INFORMATION CENTER
IN OPPOSITION TO MOTION FOR STAY PENDING REVIEW

Luke J. Danielson
NATIONAL WILDLIFE FEDERATION

Alice Hector
SOUTHWEST RESEARCH &
INFORMATION CENTER

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MEMORANDUM

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I. INTRODUCTION.

The Nuclear Regulatory Commission rules here under attack represent a significant step toward solving a major environmental problem. The rules represent the culmination of a lengthy proceeding in which dozens of individuals and organizations participated. They also represent a major milestone on a path which Congress--after years of frustration, debate, and delay--carefully charted in 1978.

Amici participated in the NRC proceedings, and offered many proposals, few of which were accepted. Despite their belief that the regulations could and should be more stringent, amici urge this Court not to stay their effect. A stay would have the effect of undermining clear Congressional intent to require prompt and effective action to strengthen the inadequate regulatory structure at both the federal and state levels which:

- has saddled the taxpayers with the burden of paying well over $100 million to clean up improperly managed tailings;
- has continued to allow tailings to be disposed of in an unacceptable manner, burdening future generations with large and unwanted problems; and
- has resulted in a significant disparity in licensing practices and procedures between NRC and the Agreement States.

Petitioners are not entitled to a stay because they have made no showing of a likelihood of success on the merits. Further, the alleged injuries they contend they will suffer from implementation of these regulations were considered by Congress and NRC, and are far outweighed by the interest of the public in establishing--for the first time--a comprehensive program for control of a significant environmental hazard. No stay should be granted.

II. THE NEED FOR, AND EFFECTS OF, UMTRCA.

A. Uranium Mill Tailings Regulation Prior to UMTRCA.

The Uranium Mill Tailings Radiation Control Act of 1978 ("UMTRCA"), Pub. L. No. 95-604, represented an attempt by Congress to address a long-neglected problem.[1]

The Atomic Energy Act of 1954, 42 U.S.C. §§ 2011, *et seq.*, created a pervasive federal scheme of regulation of certain radiation hazards incident to the nuclear fuel cycle. That Act gave the Atomic Energy Commission (now the Nuclear Regulatory Commission) the duty to regulate "special nuclear material,"[2] "source material,"[3] and "byproduct material." Byproduct material was defined by the Act before the UMTRCA amendments to include:

> any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.[4]

While tailings from the milling of uranium might appear to be "radioactive material . . . yielded in . . . the process of producing . . . special nuclear material," and thus licensable under the Act, the AEC and NRC took the position that tailings were not subject to the Act's licensing requirements.[5] Such minimal environmental control of these tailings as did occur was therefore simply an incident to licensing of the "source material" handled by uranium mills.

---

[1] Federal awareness of problems of improper tailings disposal dates back at least to 1966, when a joint federal agency position was reached to work for improved control of tailings. Efforts made under this agreement were, in the Department of Energy's view, "far from satisfactory." H.R. Rep. No. 95-1480, 95th Cong., 2nd Sess. (1978); reprinted in (1978) U.S. Code Cong. & Ad. News 7433, 7454 (hereinafter cited as "House Report"). *See also* *Uranium Mill Tailings: Congress Addresses a Long-Neglected Problem*, 202 Science 191 (1978).

[2] "Special nuclear material" is plutonium or enriched uranium. 42 U.S.C. § 2014(aa) (1976).

[3] "Source material includes unenriched uranium, thorium, and their ores. 42 U.S.C. § 2014(z)(1976).

[4] 42 U.S.C. § 2014(e) (1976).

[5] House Report, *supra* note 1, (1978) U.S. Code Cong. & Ad. News at 7456-57.

When the mill became inactive and its source materials license expired, Commission regulatory control over tailings ended.[6] Even at active mills, control over tailings was "minimal."[7]

In 1959, Congress amended the Atomic Energy Act to allow states to assume, under certain conditions, some of the licensing authority over source and byproduct material. Three states with currently active conventional uranium mills--New Mexico, Colorado, and Washington--subsequently sought and received such delegation and became "Agreement States."[8] The scope of state licensing authority generally paralleled that of the Commission under the AEA.

B. The Hazards of Uranium Mill Tailings.

Uranium mill tailings are a sandy waste produced by the milling of uranium ores.

> Because only 1 to 5 pounds of useable uranium is extracted from each 2,000 pounds of ore, tremendous quantities of waste are produced as a result of milling operations. These tailings contain many naturally-occurring hazardous substances, both radioactive and nonradioactive. The greatest threat to public health and safety is presented by the long radioactive decay process of radium into

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[6] Id. at 7457.

[7] House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7434. The committee was:

> also convinced that it would be a grievous and costly mistake to authorize a remedial program for inactive mill sites without also enacting regulatory legislation to control the even more serious problem at active mill sites.

Id. at 7456 (emphasis supplied). These problems include not only ongoing release from wind action, seepage to groundwater and surface runoff, but repeated accidental releases. See NRC Draft Generic Environmental Impact Statement on Uranium Milling at 7-5 (1980) (hereinafter "Final GEIS"); 45 Fed. Reg. 2424 (1980). See Linker, et al., Radioactive Waste: Gaps in the Regulatory System, 56 Denver L. J. 1, 7-8 (1979).

[8] Conventional mills active in 1979 are listed in the Final GEIS, supra, note 7 at 3-6.

> radon-222, an inert gas which may cause cancer or genetic mutations. This decay process, and the dangers which accompany it, will continue for a billion years. As a result of being for all practical purposes, a perpetual hazard, uranium mill tailings present the major threat of the nuclear fuel cycle.[9]

Uranium-238 comprises over 99% of the uranium occurring in nature. Over many years, it decays, through fourteen intermediate radioactive decay stages into a stable isotope of lead.[10] Thus, each of the thirteen radioactive "daughter products" of uranium, each with its own physical and chemical properties, is found in uranium mill tailings.

Significant quantities of toxic materials, including arsenic, cadmium, lead, molybdenum, and selenium, are also found in mill tailings.[11] The most common milling process, the "acid leach" system, involves addition of about 45 kilograms of sulfuric acid per metric ton of ore.[12] The sulfuric acid and the products of its decomposition are a hazard in themselves; they also increase the hazards associated with certain of the other materials by increasing their mobility in ground and surface waters.

Tailings at a number of sites have been abandoned.[13] Since state and federal authority was, prior to 1978, simply an incident to licensing of milling operations, little authority existed to require stabilization of these 26 million tons of "orphaned" tailings.

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[9] House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7433 (emphasis added).

[10] See Final GEIS, supra note 7, at C-3.

[11] Chemistry of typical tailings pond liquid is set out in Table E-3.1. Id. at E-16. See also id. at 6-8.

[12] Id. at 5-5.

[13] House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7458.

Neither was there, in the view of Congress, an adequate program to insure safe disposal of tailings at active sites.

Effective and safe disposal of tailings is not simple. Wind-blown particulates must be controlled, if they are not to impair use of surrounding lands. Seepage to groundwater must be eliminated or minimized, and escape to surface waters must be prevented, if water users are to be protected. Exhalation of radon must be reduced to protect public health. These tasks are complicated by the fact that each of the numerous potential pollutants has its own distinct chemical properties.[14/] And all of these goals must be met by means which show some promise of lasting far into the future, if inordinate costs are not to be borne by future generations.

It is worth noting that the General Accounting Office estimated in 1978 that cleanup of abandoned sites alone--representing only 26 million of the then existing 140 million tons of tailings--would cost $126 million, most of which would have to be paid by federal taxpayers.[15/] Almost certainly the $126 million figure is low. It is certainly very low compared to the costs which will have to be borne by future taxpayers if an effective program of tailings control is not implemented promptly, to solve "the even more serious problem at active mill sites."[16/]

[14/] "Development of a sound technology for containment of contaminants in uranium mill tailings requires the understanding of the geochemical behavior of the materials as well as the geochemical conditions along the pathways contaminants take from the tailing (sic), into the environment." G. Markos, Geochemical Mobility and Transfer of Contaminants in Uranium Mill Tailings, Proceedings of the Second Symposium on Uranium Mill Tailings Management, 55, (1979), cited in Final GEIS, supra note 7, at 8-30.

[15/] House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7455. DOE has estimated costs to the federal government alone at up to $180 million. Id. at 7461.

[16/] House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7456.

C. Agreement State Programs.

The regulation of uranium milling by Agreement States, and ancillary regulation of uranium mill tailings disposal, have been repeatedly criticized on the grounds that states have not committed resources sufficient to ensure effective regulation, that state procedures did not allow informed or effective public participation in licensing, and that state regulation was not as stringent as regulation by NRC in non-agreement states.[17/]

Under the 1959 amendments to the Atomic Energy Act, the Commission was allowed to enter into an agreement with a state if the state's radiation control standards were "compatible" with the Commission's.[18/] The Commission could only suspend or terminate an agreement where "required to protect the public health and safety."[19/]

These provisions led to difficulty and uncertainty. First, "compatibility" was a nebulous standard. Presumably, it meant that within some range, state standards could be stronger or weaker than NRC's standards. But how wide was that range?

Second, as AEC and NRC understanding of radiation hazards and nuclear technology improved, regulations were from time to time changed. If a state failed to follow suit and update its regulations, the only remedy available to the Commission was to contend that the state program was inadequate to protect public health and safety. Such a contention was particularly difficult for the Commission to make where the state standards were based on earlier, outdated standards promulgated by the Commission itself.

[17/] See generally Comptroller General, General Accounting Office, Radiation Control Programs Provide Limited Protection (1979). See also Final GEIS, supra, note 8, at A-91-94.

[18/] 42 U.S.C. § 2021(d)(2) (1976).

[19/] 42 U.S.C. § 2021(j) (1976).

Finally, other legislative changes, such as the enactment of the National Environmental Policy Act, led to an anomalous situation. In non-Agreement States, licensing of uranium milling facilities included preparation of environmental impact statements, extensive public hearings, and the ability of affected private citizens to test contentions relating to the design and integrity of systems for long-term disposal of tailings. In Agreement States, no such requirements applied.[20]

D. *The UMTRCA Reforms.*

In 1978, through UMTRCA, Congress acted decisively to address the tailings problem. Features of the Act include:

- the Title I program for federal and state cooperation in cleaning up abandoned tailings sites;
- amendment of the definition of "byproduct material" explicitly to include mill tailings;[21]
- abolition of "compatibility" as a standard for state programs, and its replacement with more specific requirements;[22]
- mandatory procedural standards for state programs, including public hearings, the opportunity for cross-examination, and a written environmental impact analysis;[23]
- a provision for adequate decontamination and reclamation of facilities prior to license termination, and long-term bonding;[24]

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[20] In one case, it was unsuccessfully contended that NRC involvement in state licensing constituted "major federal action" triggering NEPA. *See Natural Resources Defense Council v. NRC*, 578 F.2d 1341 (10th Cir. 1978). *See* Linker, *et al.*, *Radioactive Waste: Gaps in the Regulatory System*, 56 Denver L.J. 1, 12-14 (1979).

[21] Uranium Mill Tailings Radiation Control Act ("UMTRCA") of 1978, Pub. L. No. 95-604, § 201, *amending* section 11e of the Atomic Energy Act of 1954 ("AEA"), 42 U.S.C. § 2014(e) (Supp. 1980).

[22] UMTRCA, Pub. L. No. 95-604, § 204(b), *amending* § 274d(2) of the AEA, 42 U.S.C. § 2021d(2) (Supp. 1980).

[23] UMTRCA, Pub. L. No. 95-604, § 204(e), *adding* AEA § 274o, 42 U.S.C. § 2021o (Supp. 1980).

[24] UMTRCA, Pub. L. No. 95-604, § 203, *adding* AEA § 161x, 42 U.S.C. § 2201x (Supp. 1980).

° new Commission authority over management of byproduct material;[25]

° promulgation by EPA of standards of general applicability for protection of public health and safety and the environment from tailings hazards;[26] and

° periodic NRC review of adequacy of Agreement State programs.[27]

III. PETITIONERS' CHALLENGE TO THE NRC RULES IS WITHOUT MERIT.

The statutory mandate of UMTRCA was clear. NRC was, for the first time, to exert direct licensing authority over uranium mill tailings. NRC promptly instituted a rulemaking to determine what rules should apply to the granting of such licenses. To aid in that rulemaking, NRC prepared a voluminous Generic Environmental Impact Statement on Uranium Milling.

Petitioners argue these propositions:

1. Because Congress gave EPA authority to promulgate certain general standards in UMTRCA, NRC is without power to impose licensing requirements until EPA acts;[28]

2. NRC is acting in excess of its authority in certain exchanges of correspondence with Agreement States;[29]

3. A hardship would be imposed on petitioners by failure to grant a stay;[30] and

4. The rulemaking was not properly conducted because certain materials were not made available to the public.[31]

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[25] UMTRCA, Pub. L. No. 95-604, § 205(a), adding AEA § 84(a)(1), 42 U.S.C. § 2114(a)(1) (Supp. 1980).

[26] UMTRCA, Pub. L. No. 95-604, § 206, adding AEA § 275, 42 U.S.C. § 2022 (Supp. 1980).

[27] UMTRCA, Pub. L. No. 95-604, § 204(d)(3), amending AEA § 274j, 42 U.S.C. § 2021j (Supp. 1980).

[28] Petitioners' Memorandum in Support of Motion for a Stay Pending Review ("Petitioners' Memorandum"), at 7-10.

[29] Id. at 3-7.

[30] Id. at 13-15.

[31] Id. at 10-11.

The last of these propositions is not within the knowledge of amici, who, having been assured that NRC has an adequate response, will confine their argument to the first three contentions.

A. NRC Had Clear Authority to Issue the Rules Here at Issue.

One of the major changes in UMTRCA was the redefinition of byproduct material explicitly to include mill tailings. This change was effective immediately.[32] Therefore, it became illegal for any person within the Commission's jurisdiction to "transfer or receive in interstate commerce, manufacture, produce, transfer, acquire, own, possess, import, or export" uranium mill tailings without a license.[33]

The power to license logically carries with it the power to set general terms and conditions for issuance of licenses. Section 161(b) of the AEA allows the Commission to "establish by rule, regulation, or order such standards and instructions to govern the possession and use of . . . byproduct material as the Commission may deem necessary or desireable to protect public health. . . ."[34]

In addition, specific requirements were imposed by Congress in UMTRCA to:

> Establish by rule, regulation, or order . . . such standards and instructions as the Commission may deem necessary or desireable to insure--
>
> (1) that an adequate bond, surety, or other financial arrangement (as determined by the Commission) will be provided, before termination of any license for byproduct material . . . to permit the completion of all requirements established by the Commission. . . . and
>
> (2) that--(A) in the case of any such license issued or renewed after November 8, 1978, the need for long term

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[32] UMTRCA, Pub. L. No. 95-604, § 208 (1978).

[33] AEA § 81, 42 U.S.C. § 2111 (Supp. 1980).

[34] AEA § 161(b), 42 U.S.C. § 2201(b) (Supp. 1980).

> maintenance and monitoring of such sites . . . after termination of such license will be minimized and, to the maximum extent practicable, eliminated. . . .[35]

Finally, the Commission is given the specific authority in new AEA § 84(a)(1) to insure that management of tailings is carried out in such manner as

> the Commission deems appropriate to protect the public health and safety and the environment from radiological and nonradiological hazards associated with the processing and with the possession and transfer of such material.[36]

Petitioners' contention that NRC lacks power to promulgate rules governing mill tailings disposal simply evaporates in the face of this extensive statutory authority. Any statutory support for petitioners' position that this authority is in some way contingent on EPA action would logically have to come from one of two sources: section 84 or section 275 of the AEA, both added by UMTRCA.

Section 84(a)(2) of the AEA requires the Commission to insure licensee conformance with "applicable general standards" to be promulgated by EPA.[37] However, no such general standards have been promulgated, none are on the immediate horizon,[38] and none are therefore "applicable." Nothing in section 84 indicates that the Commission's authority under section 84(a)(1) is in any way contingent on the EPA regulations referred to in section 84(a)(2). Even were the statute to be read in such a tortured manner, section 84 provides that "[n]othing in this section affects any authority of the Commission under any other provision of this Act."[39] The Commission's more than ample authority under sections 81 and 161(b) of the AEA would therefore be utterly unaffected even by the reading of section 84 most favorable to petitioners.

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[35] UMTRCA, Pub. L. No. 95-604, § 203, *adding* AEA § 161x, 42 U.S.C. § 2201(x) (Supp. 1980).

[36] UMTRCA, Pub. L. No. 95-604, § 205, *adding* AEA § 84, 42 U.S.C. § 2114 (Supp. 1980).

[37] *Id.*

[38] EPA now believes that final standards will not be in effect until April of 1983. 46 Fed. Reg. 23697 (April 27, 1981).

Neither does section 275 of the AEA aid petitioners. Section 275 does require EPA to promulgate "standards _of general application_ for the protection of the public health, safety, and the environment . . ."[40] from the hazards of mill tailings. EPA, after representing that it could set such standards in six months,[41] has failed to meet Congress' deadline, and now projects a final rule in about two more years.[42] This is unfortunate.

But EPA's standards, which are _not_ to be site specific,[43] are not in any way essential to the clear responsibility of NRC to establish management standards, or specific requirements applicable to licensees. Congress clearly recognized that NRC could issue "new substantive standards for the control of mill tailings" under UMTRCA.[44]

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[39] UMTRCA, Pub. L. No. 95-604, § 205(a), _adding_ AEA § 84b, 42 U.S.C. § 2114(b) (Supp. 1980).

[40] UMTRCA, Pub. L. No. 95-604, § 206(a), _adding_ AEA § 275b(1), 42 U.S.C. § 2022b(1) (Supp. 1980) (emphasis added).

[41] House Report, _supra_, note 1, (1978) U.S. Code Cong. & Ad. News at 7473.

[42] _See_ note 38, _supra_.

[43] _See_ note 48, _infra_.

[44] _See_ 125 Cong. Rec. S 15356 (Daily Ed., Oct. 29, 1979) (remarks of _Senator_ Domenici), relating to the 1979 clarifying amendments to UMTRCA, Pub. L. No. 96-106.

Finally, petitioners argue "that nothing in the UMTRC Act was intended to undercut EPA's role, conferred by Reorganization Plan No. 3 of 1970, (citation omitted) to establish generally applicable standards. . . ."[45] This is correct. However, both UMTRCA and the Reorganization Plan have a common scheme, which petitioners are apparently unwilling to perceive: specific standards for licensing, conduct of licensees, management of tailings, and long term care are to be set by NRC,[46] while general standards for protection of the environment and public health are the province of EPA.[47] While as Congress has recognized, the distinction may occasionally present difficulties in practice,[48] it is conceptually quite clear.

It is also worth noting that many of petitioners have argued vigorously to another Court that "Reorganization Plan No. 3 of 1970 is unlawful insofar as it purports to transfer power to impose environmental standards to EPA."[49] How then can petitioners claim that the Plan gives complete authority to EPA, to the exclusion of NRC's authority to adopt the regulations here at issue?

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[45] Petitioners' Memorandum at 8.

[46] *See* statutory provisions cited in notes 35-37, *supra*.

[47] Reorganization Plan No. 3 of 1970, 42 U.S.C.A. § 4321 note, § 2(a)(6), UMTRCA, Pub. L. No. 95-604 § 206(a), 42 U.S.C. § 2022(b) (Supp. 1980).

[48] The House Committee was satisfied that this division of authority--NRC being required to "establish management requirements for the uranium mill tailings," and EPA retaining "its generally applicable standards--setting authority under the Atomic Energy Act"--resolved "a very difficult problem." The committee stressed "that the EPA standards are not to be site-specific," for the clear reason that such site-specific standards were the province of NRC. House Report, *supra*, note 1, (1978) U.S. Code Cong. & Ad. News 7473.

[49] *Kerr-McGee Nuclear Corporation, et al. v. United States Environmental Protection Agency, et al.*, Civ. 80-0203C (United States District Court for the District of New Mexico), Memorandum in Support of Plaintiffs' Motion for Summary Judgment at 19. Pages 13 through 19 of said memorandum are attached hereto as Exhibit A.

Petitioners' argument would have these logical conclusions:

(1) despite Congress' clear directive that NRC enforce certain requirements for new licenses or renewals immediately on the effective date of UMTRCA,[50] no such requirements could be enforced pending EPA action; and

(2) NRC would have a clear mandate to issue licenses, and to protect the public health and safety, but would be without authority to establish rules insuring adequate standards for licensees.

Petitioners' contention is without merit.

B. Petitioners' Contentions with Respect to Agreement State Status Have No Bearing on the Validity of NRC's Rules and Are Inaccurate.

Agreement State responsibilities under UMTRCA are clear. The states, irrespective of any action by federal agencies, are required to comply with section 83(b) respecting ownership of tailings disposal sites, and to adopt the procedural reforms in new section 274 (o)(3) of the AEA.[51]

In addition, states are to require of licensees:

> compliance with standards which shall be adopted by the State for the protection of the public health, safety, and the environment from hazards associated with such material which are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission for the same purpose, including requirements and standards promulgated by the Commission and the Administrator of the Environmental Protection Agency pursuant to sections 2113, 2114, and 2022 of this title. . . .[52]

1. The Alleged Controversy over UMTRCA's Requirements for Agreement States Has No Bearing on Likelihood of Success.

It is the clear understanding of *amici* that the scope of this proceeding is a limited one. It is designed to determine whether NRC abused its discretion or failed to comply with applicable law in promulgating its rules for uranium mill tailings licensing.

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[50] *See, e.g.*, UMTRCA, Pub. L. No. 95-604, §§ 203, 205, 208 (1978).

[51] UMTRCA, Pub. L. No. 95-604, § 204(e)(1), *adding* AEA §§ 274o (1) and (3), 42 U.S.C. §§ 2021o(1) and (3) (Supp. 1980).

[52] 42 U.S.C. § 2021o(2) (Supp. 1980).

If NRC's standards are valid, then Agreement States must adopt rules "equivalent, to the extent practicable, or more stringent than," NRC's rules, by November 8, 1981, the third anniversary of UMTRCA's passage. State rules are to meet this standard sooner "to the maximum extent practicable."[53]

Agreement States have known of these requirements since UMTRCA's passage in 1978. They were again put on notice by Congress in 1979. NRC's draft rules were published on August 24, 1979.[54]

The proposed rules had thus been available for over two months when the drafters of UMTRCA passed the 1979 amendments which reemphasized Congressional determination to see prompt Agreement State compliance. Yet no word was heard from Congress to the effect that NRC was required to wait for EPA action, or that the Agreement State compliance deadline should be postponed beyond 1981. NRC's final rules have been available since October 3, 1980.[55] The states still have over five months remaining to come into compliance.

Any alleged difficulties of the Agreement States in achieving compliance must be read in light of this history, and Congress' clear persistence in maintaining its deadline. Such problems, to the extent they may exist, are tangential to the issue before this Court: the validity of NRC's rules.

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[53] 42 U.S.C. § 2021, note. A 1979 amendment to UMTRCA, Pub. L. No. 96-106, made it clear that while compliance was not absolutely required before November 8, 1981, states should implement UMTRCA requirements before that date "to the maximum extent practicable." Id. See also 125 Cong. Rec. H 9772 (daily ed. Oct. 26, 1979) (remarks of Rep. Udall), and the remarks of Senator Domenici cited in note 44, supra.

[54] 44 Fed. Reg. 50015.

[55] 45 Fed. Reg. 65521.

In its role as overseer of state compliance, NRC must and should have some freedom to communicate with, cooperate with, and to some extent negotiate with, Agreement States. Positions taken in such interchange are not "final agency action," nor are they properly subject to review in this proceeding.

The mere fact of the filing of these petitions is not a ground for a stay. It is not now November 8, 1981; no one can foresee what state regulations may or may not be in effect on that date; nor can anyone foresee how NRC may or may not evaluate those regulations. Only when faced with specific problems which may arise as of Congress' deadline should this Court intervene.

2. NRC Correctly Interprets the UMTRCA Requirements.

If the Court should reach the question, it is clear that NRC, rather than petitioners, correctly interprets the statutory requirements for state programs under UMTRCA. Petitioners' argument turns on the interpretation of 42 U.S.C. § 2021(o)(2), which requires Agreement States to adopt regulations which:

> are equivalent, to the extent practicable, or more stringent than, standards adopted and enforced by the Commission for the same purpose. . . .

While the statute--particularly in light of its history--is clear enough, the accompanying House Report should remove any doubt:

> This section amends section 274 of the Atomic Energy Act to provide for adherence by Agreement States to minimum Federal standards for uranium mill tailings control, stabilization, and disposal.[56]

Petitioners would read the requirement to mean that state standards can be, at the state's option, stronger, weaker, or the same as federal standards. Such an interpretation would eviscerate

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[56] House Report, *supra*, note 1, (1978) U.S. Code Cong. & Ad. News at 7471. *See also id.* at 7443.

Congress' language and clear purpose. It is simply an attempt to resurrect the old "compatibility" doctrine which Congress deliberately and intentionally rejected with UMTRCA.

Congress intended to insure:

> that mills located in a non-agreement State are not subject to different requirements than their competitors which are located in an agreement State. Indeed, that is an objective of the entire subsection.[57]

Thus if NRC's regulations are validly promulgated, it is clear what Agreement States must do by November of this year if they are to be in compliance. They have had at least since October 3, 1980--the date NRC's rules were promulgated--to prepare to do so. On the real issue--whether NRC's regulations are valid, petitioners advance no argument even remotely adequate to demonstrate a probability of success on the merits.

IV. NO STAY IS WARRANTED.

A. Petitioners Have Not Demonstrated any Likelihood of Success on the Merits.

The centerpiece of any motion for a stay must be a demonstration of some likelihood of success on the merits.[58] Petitioners address this issue only indirectly. Their primary arguments on their likelihood of success are that Congressional delegation of certain authority to EPA bars any regulation by NRC until EPA acts, and that certain studies were not available during the rulemaking.

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[57] *Id.* at 7472 (emphasis added).

[58] "In hearings upon motions for temporary or preliminary injunctive relief, the burden is upon the one requesting such relief to make a *prima facie* case showing a reasonable probability that he will ultimately be entitled to the relief sought." *Crowther v. Seaborg*, 415 F.2d 437, 439 (10th Cir. 1969), *Lundgrin v. Claytor*, 619 F.2d 61, 63 (10th Cir. 1980).

The first of these arguments has been met above. NRC has very ample statutory authority to promulgate these rules, despite EPA's unfortunate dereliction. Amici are assured that NRC has a more than adequate response to petitioners' arguments with respect to the conduct of the rulemaking.

This leaves petitioners with no adequate argument for a likelihood of success on the merits. The alleged difficulties of Agreement States in implementing UMTRCA, dwelt on at length, have nothing at all to do with the validity of NRC's rules, which is the only issue before this Court.

While this Court has approved the Second Circuit's liberal definition of the probability of success requirement, to the effect that "it will ordinarily be enough that the plaintiff has raised questions going to the merits so serious, substantial, difficult and doubtful as to make them a fair ground for litigation,"[59] that test has not been met by petitioners.

Further, that test only applies "[w]here the movant prevails on the other factors. . . ."[60] Movants have made no adequate showing of hardship to themselves; their primary allegations are that hardships will be imposed on others, specifically New Mexico. New Mexico, it is worth noting, takes no position on the likelihood of petitioners' success, and indicates that if petitioners' success is unlikely, New Mexico can proceed without suffering significant harm.[61]

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[59] Id.

[60] Id.

[61] Brief of Amicus Curiae, State of New Mexico, in Support of Motion for Stay Pending Review, at 4.

This Court should not, absent a much stronger showing than made by petitioners, stay implementation of a long overdue regulatory program, arrived at after careful weighing of the competing contentions of many interests, of varying perspectives.

B. The Balance of Hardship Favors NRC and the Public.

Petitioners assert that "there would be no adverse impact upon NRC or the public if the regulations were stayed."[62] This simply flies in the face of the Congressional determination that stronger standards were needed, and that minimum national standards applicable to agreement state programs should be adopted promptly. Petitioners are simply re-fighting the battle which Congress settled with UMTRCA.

It is also worth noting that a number of licenses and license renewals are pending, both in Agreement and non-Agreement States.[63] The effect of a stay would be that such licenses would be issued under the old standards after November of this year, in violation of the Congressional mandate. Millions of tons of additional tailings will be generated pending final disposition of this case. If those tailings are disposed of in an unsatisfactory manner, very costly and difficult measures may be required.[64]

A scattering of examples are advanced by petitioners to support their claims of individual hardship. Western Nuclear, for example, mentions the costs it will allegedly incur in reducing groundwater contamination from its Split Rock Mill at Jeffrey City. Yet these costs are not at all unreasonable when compared to the benefits of reducing toxic and radioactive seepage, which the company itself estimates at 1300 gallons per minute, and which may well be migrating to the Sweetwater Valley and beyond, toward the Sweetwater River.[65]

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[62] Petitioners' Memorandum at 15.

[63] Id. at 15-16.

[64] "Specifications for tailings site selection and impoundment design, in particular, once implemented by a licensee, may be reversible only at great cost." House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7439.

Likewise, NRC's bonding requirements are not at all unreasonable in light of the history of abandoned mill tailings which must be cleaned up at public expense because no financially responsible owner can be found,[66] the clear statutory mandate that bonding requirements be established both for decommissioning and for long-term maintenance,[67] and NRC's elaborate analysis of the problem and potential solutions.[68] Surely, bonding provisions involve expense. Just as surely, they are costs of doing business. Without adequate bonding requirements in place, the public is subject to the serious risk of inheriting more "orphaned" tailings, which will have to be cleaned up at public expense.

Third, the problem of backfilling underground mines with tailings is addressed. The assertions are one-sided and inaccurate, and involve factual contentions which NRC has addressed.[69] Petitioners give no attention to the feasibility of backfilling with materials other than tailings, to solidifying the tailings slimes with asphalt to reduce seepage, to the value of the groundwater resource which may be protected by the NRC rule, to alternative mining methods, or to any of the other myriad factors which should have --and did--weigh in NRC's decision.[70/]

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[65] NRC, Final Environmental Impact Statement Related to Operation of Split Rock Uranium Mill at 4-3 (1980).

[66] House Report, supra, note 1, (1978) U.S. Code Cong. & Ad. News at 7457-59, 7469.

[67] 42 U.S.C. §§ 2201(x)(1), (2)(B) (Supp. 1980).

[68] Final GEIS, supra, note 7, chapter 14.

[69] Disposing of tailings in surface or underground mines after treating the more hazardous slime components with asphalt or cement are in fact Alternatives 7 and 8, Final GEIS, supra, note 7, at 11-6, and Appendix K.

Petitioners simply overstate the gravity of the alleged problem, which in any case is not yet imminent. New Mexico must adopt rules complying with UMTRCA. Application of those rules to petitioners' facilities will require site-specific analysis of both the local groundwater resource and milling technology. A myriad of potential alternatives--none of which have been thoroughly analyzed on a site-specific basis, may be available. If and when any unreasonable or arbitrary requirements are imposed on any operator, there will be adequate time available to seek relief with respect to any specific problems which may arise, based on a much better-developed record than the one now before the Court.

Finally, petitioners assert that "the risks posed by staying the 71 regulations are de minimis."[71/] Yet petitioners fail to

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[70/] There is certainly no way of telling now what effects the regulations would have on operators who employ sand backfilling. NRC notes that depositing tailings in mines using the techniques described in the Final GEIS at 11-6, would mean that tailings "are assumed to be sufficiently resistant to leaching, that exposure to groundwater would be permissible" (emphasis added). Further, NRC has stated that "[r]egulations provide flexibility for licensees or applicants to demonstrate that contacting tailings with groundwater will not degrade the quality of useable groundwater." Id. at A-98 (emphasis in original).

In view of NRC's further statement that the "specific seepage control method, or combination of methods to be used must be worked out on a site-specific basis," 45 Fed. Reg. 65534, petitioners' concerns seem premature.

[71/] Petitioners' Memorandum at 16, n. 29. The figure cited by petitioners is not the fatal cancer risk factor for an individual living in the "vicinity" of the mill, which is 0.13%, 100 times higher than petitioners' figure. Final GEIS, supra, note 7, at 6-39. (cont.)

acknowledge the substantial uncertainties surrounding the relationship between low levels of radiation and health effects,[72] and the strong possibility that NRC's estimates of health effects are too low.[73] Neither do they address the serious *economic* effects of

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71/ (cont.)
Rather, petitioners' figure represents risk to individuals in the *entire region*, which is a 6000 square mile area surrounding the mill. *Id.* at 4-1, 6-39. *Any* risk may be minimized by averaging it over a larger population: the risk to any particular individual in the Denver metropolitan area from flash floods in the Big Thompson Canyon is fairly small. The risk to an individual living in the Canyon is substantially higher. Nor do petitioners mention the risks of non-fatal cancer, genetic defects, or other radiation or toxic-induced injuries, which NRC considered, and the Court should weigh.

In any case, it should be noted that all of these numbers in fact represent central values of wide ranges of possible estimates. *Id.* at G-58, Table G-7.1.

[72] The National Academy of Sciences Committee on the Biological Effects of Ionizing Radiations has stated "that there is great uncertainty in regard to the shape of the dose-response curve for cancer induction by radiation, especially at low doses. Estimates of risk at low doses *depend more on what is assumed about the mathematical form of the dose-response function than on the data themselves.*" *The Effects on Populations of Exposure to Low Levels of Ionizing Radiation* at 4 (1980) (emphasis added); draft cited in Final GEIS, *supra*, note 7, at A-33. "Much of the controversy over the effects of low-level radiation has centered about the question of whether linear extrapolation downward from high exposures to zero dose and zero response is a reasonable approach." Archer, *Effects of Low-Level Radiation: A Critical Review*, 21 Nuclear Safety 68, 75 (1980). "[T]he shape of a dose-response relationship at low doses may be practically impossible to ascertain statistically. This is because the sample sizes required . . . are extremely large. . . ." National Academy of Sciences, *supra*, at 187.

[73] There are numerous methods of attempting to estimate health effects of low-level radiation. NRC's figures are based on averaging the results of different techniques, Final GEIS, *supra*, note 7, at A-32, and are thus "not as high as some found in the literature." *Id.*

NRC's figures are also based on the assumption of a linear relationship between dose and response: that there will be the same number of health effects per dose at low levels of exposure as at high levels. *Id.* at A-35. Yet "[e]pidemiological and experimental data suggest that the effect per dose of alpha radiation at low dose rates *is greater than at high dose rates*. National Academy of Sciences, *supra*, note 74 at 188 (emphasis added). This is sharply at variance with NRC's assumption of linear extrapolation. Archer, note 72, *supra*, also states, at 75: "For alpha particles . . .
(cont.)

continued radioactive and toxic pollution of grazing or agricultural land or valuable water supplies. Nor do they mention the overriding problem of tailings disposal: adequacy is tested not in terms of fifteen years, but in terms of the 100,000 to 1,000,000,000 years during which tailings must be safely contained.

Petitioners' alleged injuries are not imminent; the possibility of some speculative or hypothetical future injury to them is far outweighed by the public's interest in seeing Congress' clear purpose fulfilled, and in protecting the public against the health and economic risks inherent in inadequate disposal, and the risk of the need for further taxpayer-funded cleanup requirements. The public also has an interest in assuring that significant numbers of licenses would not be issued during the pendency of a stay, for once a tailings disposal system is licensed and operating, it is exceedingly difficult and expensive to change if it is subsequently determined that the system is unsatisfactory.[74] A stay would therefore be adverse to the public interest.

73/ (cont.)
there is evidence that carcinogenicity per rad *is substantially greater both at low doses and with protracted exposure periods than it is at high doses with short exposure*" (emphasis added). Since radon (like many of the other radionuclides found in tailings) is an alpha-emitter, risk figures are "quite likely to underestimate the risk when linear extrapolation downward from high levels is used." *Id.*

It should also be noted that NRC did *not* include in its figures the substantial amount of radiation released by sources related to uranium mining, such as radon and particulate escape from mines, which would substantially increase the dose to those in areas affected by mining and milling. Final GEIS, *supra*, note 7, at A-15. Some other NRC assumptions, such as the size distribution of yellowcake particles, are "not necessarily conservative." *Id.* at A-17.

[74] *See* note 64, *supra*. One effect of a stay might well be an inclination on the part of some operators to press vigorously for consideration of license applications before new regulations become applicable.

Since petitioners have failed to meet the last three requirements for a stay enunciated in Lundgrin v. Claytor,[75] they are not entitled to have their motion judged by the "liberal" Hamilton Watch Co. doctrine.[76] Even under the Hamilton doctrine they would fail, because they have not advanced any cogent legal theory on which they have raised questions going to the merits so serious, substantial, difficult and doubtful as to make them a fair ground for litigation.

V. CONCLUSION.

Petitioners ask this Court to take an enormous step by, in effect, extending a deadline which Congress has repeatedly affirmed. After over 15 years of study, concern, and, finally, Congressional action, a program is evolving to address a significant environmental and public health problem. That program should only be upset if this Court concludes that petitioners have made a strong case for the likelihood of their success on the merits. No such case having been made, the Motion for Stay should be denied.

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[75] Those requirements are irreparable injury to movant, that harm to movant would outweigh damage to the opposing party, and that a stay would not be adverse to the public interest. 619 F.2d at 63.

[76] The standard defined by Hamilton Watch Co. v. Benrus Watch Co., 206 F.2d 738, 740 (2d Cir. 1953), only applies "[w]here the movant prevails on the other factors. . . ." Lundgrin v. Claytor, 619 F.2d 61, 63 (10th Cir. 1980).

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CERTIFICATE OF SERVICE

I hereby certify that the foregoing Motion for Leave to File Memorandum of *Amici* in Opposition to Motion for Stay Pending Review, and the Memorandum of *Amici* National Wildlife Federation in Opposition to Motion for Stay Pending Review were served on all counsel of record [illegible] placing copies of the same in the United States Mail, postage prepaid, this 18th day of May, 1981.

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IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF NEW MEXICO

FILED
UNITED STATES DISTRICT COURT
SANTA FE, NEW MEXICO

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BY ______________ DEP. CLERK

KERR-McGEE NUCLEAR CORPORATION,
UNITED NUCLEAR-HOMESTAKE PARTNERS,
GULF OIL CORPORATION,
ANACONDA COPPER COMPANY (a division of
The Anaconda Company),
UNION CARBIDE CORPORATION, and
WESTERN NUCLEAR, INC.,

Plaintiffs

vs.

CIV 80-0203C

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY, and
DOUGLAS M. COSTLE,

Defendants.

MEMORANDUM IN SUPPORT OF PLAINTIFFS' MOTION FOR PARTIAL SUMMARY JUDGMENT

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190, are "in excess of statutory jurisdiction, authority, or limitations, or short of statutory right." 40 C.F.R. Part 190 is in excess of the authority lawfully vested in the EPA and the EPA Administrator and is erroneous as a matter of law. It, like other regulations "which ... operate[] to create a rule out of harmony with the statute, is a mere nullity." Dixon v. United States, 381 U.S. 68, 74 (1965). Accord, United States v. Larionoff, 431 U.S. 864, 873 (1977); Manhattan Gen. Equity Co. v. Commissioner of Internal Revenue, 297 U.S. 129, 134 (1936). "Whenever administrative action exceeds the authority delegated to [the agency] by Congress, it is appropriate for an aggrieved person to obtain relief from the infringement of such excess." L & M Industries, Inc. v. Kenter, 458 F.2d 968, 971 (2d Cir. 1972). Plaintiffs, who are threatened with the application of Part 190 to their uranium milling operations on December 1 of this year, are entitled to relief here. A judgment declaring the 40 C.F.R. Part 190 regulations invalid as applied to uranium milling activities is appropriate.

I. REORGANIZATION PLAN NO. 3 OF 1970 CANNOT LAWFULLY AUTHORIZE THE EPA ADMINISTRATOR TO IMPOSE "GENERALLY APPLICABLE ENVIRONMENTAL STANDARDS FOR THE PROTECTION OF THE GENERAL ENVIRONMENT FROM RADIOACTIVE MATERIAL"

EPA promulgated 40 C.F.R. Part 190 pursuant to authority it purportedly obtained under Reorganization Plan No. 3 of 1970. The simple fact is, however, that EPA can not lawfully have obtained the authority to issue 40 C.F.R. Part 190 pursuant to a reorganization plan.

A reorganization plan may not create new substantive authority or create a new function where none had existed before. The applicable statute, 5 U.S.C. § 905(a)(4), specifically provides that a reorganization plan may not "authoriz[e] an agency to exercise a function which is not expressly authorized by law at the time the plan is transmitted to Congress." Under this provision, the authority which may lawfully be transferred to EPA from other agencies through a reorganization is restricted to that already conferred on those other agencies.

EPA's authority to establish radiation standards can be derived only from two provisions of the Atomic Energy Act: Section 161(b) and 274(h). Section 274(h) of that Act, 42 U.S.C. § 2021(h), provided for a Federal Radiation Council (FRC) with authority to "advise the President with respect to radiation matters." Since the Council's statutory role was purely advisory, EPA can not rely on Section 274(h) for authority to issue binding "environmental standards," such as those in Part 190.[1/]

Section 161(b) of the Atomic Energy Act, 42 U.S.C. § 2201(b), on the other hand, does confer authority on the Atomic Energy Commission to establish "standards ... to promote the common defense and security or to protect health or to minimize danger to life or property." However, Section 161(b) nowhere mentions authority to issue standards to "protect the environment," the authority allegedly transferred to EPA under

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1/ Pertinent legislative history confirms this view. *See* 105 Cong. Rec. 19044-45 (Sept. 11, 1959) (colloquy over authority of FRC). The FRC's limited authority was also recognized during consideration of Reorganization Plan No. 3:

> "The FRC has no regulatory authority, it establishes no legal limits, it has promulgated no emission standards of any kind, and its recommendations to the President are not processed through the Administrative Procedures Act." *Hearings before a Subcommittee of the House Committee on Government Operations on Reorganization Plan No. 3 of 1970*, 91st Cong., 2d Sess. at 133 (1970).

the reorganization plan. If that authority exists, it must somehow be implicit in the expressions "protect health" and "minimize danger to life or property." These expressions are not defined in the Atomic Energy Act, but the relevant legislative history, which dates from the Atomic Energy Act of 1946, is instructive. That history indicates that Congress employed these terms to confer authority on the Atomic Energy Commission not to regulate in order to protect the environment against hypothetical and remote risks but instead to protect the public against serious safety hazards which could arise from nuclear operations. For example, the pertinent Senate Report explains that Congress intended the Atomic Energy Commission to safeguard against "serious hazards to public health and safety" and to seek the "minimiz[ation] [of] the danger from explosion, radioactivity and other harmful or toxic effects incident to the presence of [fissionable and by-product] materials." Sen Rep. No. 1211, 79th Cong., 2d Sess. at 14 & 28, in 1946 USCCAN 1330 & 1335. Nothing in this history suggests that Congress intended to confer authority on any agency to establish standards "for the protection of the general environment."[1] Accordingly, Section 161(b) cannot be read to empower any agency to issue "environmental standards."

The government may argue that although the reorganization plan fallaciously sought to transfer to EPA non-existent authority to issue "environmental standards," the standards contained in 40 C.F.R. Part 190 may be viewed as "health" or "safety" standards authorized by the Atomic Energy Act and are nevertheless valid for this reason. This argument is unavailing. Reorganization Plan No. 3 did not transfer any authority to EPA to issue health or safety standards; the plan spoke only in terms of standards "for the protection of the general environment." In any event, 40 C.F.R. Part 190 can hardly be deemed a "health" or "safety" standard. It is far more stringent than genuine health or safety standards which, as the Supreme Court explained in Industrial Union Department v. American Petroleum Institute, ____ U.S. ____ (July 2, 1980), are not intended to render an activity "risk-free." "[S]afe," Justice Stevens said, "is not the equivalent of being risk-free." A condition is "unsafe" only if it poses a "significant risk of harm." Id., ____ U.S. at ____, 48 U.S.L.W. at 5031. The 40 CFR Part 190 standard as applied to mills is not directed against significant risk of harm. Rather, Part 190 is directed toward de minimis risks, hypothesized on the basis of the linear non-threshold model to be on the order of 0.0002 health effects per mill per year.[1] That level of "risk" is not even detectable. The fact that the Part 190 standard is not a safety standard is also demonstrated by comparing it to the general radiological health and safety standards set forth in the Federal Radiation Protection Guides.[2] The Guides provide health and safety guidance for all federal agencies and are reflected in agency regulations such as NRC's 10 C.F.R. § 20.105.[3] These standards recommend that the total annual exposure received by a member of the public be limited to 500 mrem -- a level 20 times greater than the stringent environmental standards in Part 190.[1] 40 C.F.R. Part 190 quite simply lacks any reasonable relationship to the purposes of Section 161(b) of the Atomic Energy Act. It accordingly cannot be sustained. United States v. Larionoff, 431 U.S. 864, 873 (1977); Dixon v. United States, 381 U.S. 69, 74 (1965).

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[1] With the passage of the UMTRC Act in 1978, almost two years after issuance of Part 190, Congress for the first time authorized EPA to promulgate radiation standards for the protection of the "environment" in addition to standards for protection of public health and safety. 42 U.S.C. § 2022(a) & (b). In expressly conferring authority to issue limited environmental standards upon EPA, Congress implicitly recognized that EPA lacked such authority under such power as it had to regulate to "protect health" or "to minimize danger to life or property."

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[1] See page 10 above.

[2] These standards are set forth at 25 Fed. Reg. 4402 (May 18, 1960).

[3] 10 C.F.R. § 20.105 is applicable to uranium milling.

On the other hand, if Section 161(b) is so broad as to encompass "environmental standards," no matter how stringent, within its ambit, it constitutes an unfettered delegation of legislative power by Congress to an agency of the executive branch. Such a "sweeping delegation of legislative power" is unconstitutional under the Supreme Court's reasoning in Schechter Poultry Corp. v. United States, 295 U.S. 495, 539 (1935), and Panama Refining Co. v. Ryan, 293 U.S. 388 (1935). See also Industrial Union Department v. American Petroleum Institute, ____ U.S. ____, ____, 48 U.S.L.W. 5022, 5032 (July 2, 1980) and ___ U.S. at _____, 48 U.S.L.W. at 5039 (Rehnquist, J., concurring).[2]

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[1] As noted earlier, Part 190 imposes exposure limitations considerably more stringent than the limitations EPA has recently proposed for inactive mill tailings. The latter limitations, proposed under the UMTRC Act, would permit exposures from mill tailings over three times greater than those permitted by Part 190. See 45 Fed. Reg. 27372 (April 22, 1980) (proposing maximum permissible exposure of 80 mrad per year). Enigmatically, it is the UMTRC Act which, for the first time, purports to afford EPA any express authority to regulate to protect the environment. See Section 206 of the UMTRC Act, 92 Stat. 3039-40, adding Section 275 to the Atomic Energy Act.

[2] The government may also seek to vindicate Part 190 by reference to Sections 161(i)(3) or 161(p) of the Atomic Energy Act, 42 U.S.C. § 2201(i)(3) & (p) respectively. Neither are availing to the government's position, for, among other things, neither confer any authority beyond that conferred by Section 161(b). Section 161(i)(3) merely empowers the AEC to "prescribe" regulations "to govern any activity authorized pursuant to this chapter . . . in order to protect health and to

(footnote cont'd)

Reorganization Plan No. 3 seeks to effect a transfer of authority to EPA which is unlawful under 5 U.S.C. § 905(a)(5) in yet another way. In enacting Section 161(b), Congress tied authority to regulate for the protection of health and safety to authority to regulate to enhance the common defense or security. Indeed, Congress specifically found that "[t]he processing . . . of source material [i.e., uranium and uranium ore] must be regulated . . . in order to provide for the common defense and security and to protect the health and safety of the public." 42 U.S.C. § 2012(d) (emphasis added). Moreover, Congress, in its statement of the purposes of the Atomic Energy Act, expressly coupled regulatory authority to a program to develop and utilize atomic energy "to the maximum extent." 42 U.S.C. § 2013(d). "It is the purpose of this chapter," Congress said, to provide

> "a program to encourage widespread participation in the development and utilization of atomic energy for peaceful purposes to the maximum extent consistent with the common defense and security and with the health and safety of the public . . . ." Section 3(d), 42 U.S.C. § 2013(d) (emphasis added).

It is hardly surprising that these linkages were expressly recognized in the statute[1] for Congress in fact intended a

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(footnote cont'd)

minimize danger to life or property." Section 161(p) authorizes the AEC to make rules "to carry out the purposes of this chapter." However, the statute defines its purposes in a fashion clearly limiting the AEC to health and safety regulation. Section 3(d), 42 U.S.C. § 2013(d).

[1] Congress also referred to the linkages in speaking of the AEC's authority. For example, the Joint Committee on Atomic Energy stated, in its 1965 report, that "AEC's regulatory control was limited to considerations involving the common defense and security and the protection of the health and safety of the public with respect to the special hazards associated with the operations of nuclear facilities." Sen. Rep. No. 390, 89th Cong., 1st Sess., p. 4 (1965) (emphasis added).

careful balancing under the Atomic Energy Act between safety concerns and concerns such as interests in defense and security and the development of atomic energy.

In severing authority to regulate for environmental protection purposes from authority to regulate to protect interests in defense and security and energy development, the President, by means of Reorganization Plan No. 3, fundamentally altered the substantive nature of regulation under the Atomic Energy Act. The reorganization plan essentially destroyed the requirement that safety-type concerns be balanced again other important interests impacted by atomic energy. Since under 5 U.S.C. § 905(a)(4), a reorganization plan cannot lawfully alter substantive authority in this fashion, Reorganization Plan No. 3 of 1970 is unlawful insofar as it purports to transfer power to impose environmental standards to EPA.

II. EPA ABUSED ITS DISCRETION AND OTHERWISE ACTED CONTRARY TO LAW IN MAKING THE PART 190 STANDARDS APPLICABLE TO URANIUM MILLS

Assuming arguendo that Reorganization Plan No. 3 effected a lawful transfer of authority from the Atomic Energy Commission to EPA, EPA's exercise of that authority has nevertheless been unlawful. First, EPA prepared 40 C.F.R. Part 190 pursuant to an erroneous interpretation of its authority. The interpretation, set forth in the Ash Memorandum, prohibited EPA from imposing less stringent radiation standards on uranium mills in comparison to other fuel cycle operations as EPA had initially intended to do. Second, in promulgating Part 190, EPA unlawfully ignored the requirement that it take proper account of findings as to the practicabiliy of emission controls for uranium mills. Finally, EPA seeks to impose Part 190 standards to radiation exposure resulting from mill tailings, even though the Atomic Energy Act does not authorize

CONCLUSION

For the reasons previously stated, summary judgment should be granted in favor of plaintiffs and against EPA and the EPA Administrator on Counts I, II, and III of plaintiffs' Complaint. The EPA Administrator was not authorized to promulgate 40 C.F.R. Part 190 because the transfer of authority from the AEC to the EPA pursuant to Reorganization Plan No. 3 of 1970 was unlawful under 5 U.S.C. § 905(a)(4). Assuming arguendo that the transfer of authority was valid, 40 C.F.R. Part 190 is nevertheless unlawful because, among other things, it was devised under a misimpression concerning EPA's authority under Section 161(b) of the Atomic Energy Act as transferred by the reorganization plan. Finally, 40 C.F.R. Part 190 in any event is not applicable to uranium milling activities in states which have entered into agreements with the AEC or NRC discontinuing federal regulatory authority within those states.

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STATEMENT OF THE NATIONAL WILDLIFE FEDERATION ON IMPLEMENTATION OF THE URANIUM MILL TAILINGS RADIATION CONTROL ACT OF 1978

Luke Danielson
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June 16, 1981

INTRODUCTION

The National Wildlife Federation, America's largest conservation organization, with 4.6 million members and supporters, appreciates this opportunity to acquaint the Subcommittee with its views on implementation of the Uranium Mill Tailings Radiation Control Act of 1978.

We believe that the Act provides a sound framework for addressing a significant environmental and public health problem which has been unfortunately neglected in the past.

Unfortunately, a combination of agency delay and industry resistance have led to significant and unnecessary problems in implementation of the Act's goals. We hope that this Subcommittee, by refusing to endorse extension of the Act's deadlines, and by pressing agencies to explain their pattern of inaction, can get the process back on track.

THE REMEDIAL ACTION PROGRAM

The remedial action program for uranium mill tailings which Congress enacted in 1978 is in disarray. A few examples should suffice:

1. EPA has failed--by a wide margin--to meet the Act's 1979 deadline for promulgating disposal standards for tailings. Absent EPA standards, the Act forbids remedial action work to go forward. UMTRCA, §108(a)(2).

2. Despite the Act's clear requirements, DOE has failed to designate any of the many "vicinity properties"--houses, buildings, and other locations near tailings piles which were contaminated by tailings. DOE does not appear to be aiming at such designation in the near future. Without designation, no remedial work on vicinity properties can go forward. See UMTRCA §§102(e)(1), 103(f).

3. EPA has failed to meet its statutory deadlines in other respects. The report on uranium mine wastes required by section 114(c) is long overdue.

We are faced, as a result of this inaction, with exactly the kind of delay, incomplete cleanup, and lack of resolution which Congress wanted to avoid.

ACTIVE SITES

There has been inaction and delay in securing better control of tailings at active sites as well. Once again, EPA is over a year past its statutory deadline for promulgating standards.

The one real forward step in this area has been the promulgation by NRC of new standards for tailings control. While we have taken sharp issue with certain specifics, and while we believe that much more could be done, these standards do represent significant progress.

Most of the Agreement States in which active uranium mills exist have also made real progress. Colorado, Washington, and Texas will, as it now appears, have little difficulty in bringing their programs into compliance with NRC standards by the November deadline later this year.

There are two major obstacles which must be faced squarely.

First, a number of uranium milling companies have instituted a long and bewildering list of legal proceedings challenging NRC and EPA actions:

> (a) EPA's general radiation standards for the nuclear fuel cycle (40 C.F.R. Part 190) were attacked in federal court in New Mexico. Though the suit was dismissed, it is now on appeal.

(b) NRC's radiation standards for uranium mills (10 C.F.R. Part 20) have also been challenged.

(c) NRC's new uranium mill licensing standards have been attacked in litigation pending in the United States Court of Appeals for the Tenth Circuit.

(d) Administrative petitions challenging the radiation standards have been filed with EPA and NRC.

Other litigation may well be on the horizon.

Second, the State of New Mexico has asserted that it has problems in bringing its program into compliance with the new standards by November, the required statutory deadline.

NEW MEXICO AND THE STATUTORY DEADLINE

One of Congress' clear intentions in the 1978 Act was to insure that millers in non-Agreement states were not at a competitive disadvantage compared to millers in Agreement states.

Since by November, all milling companies in the United States except those in New Mexico will be meeting equivalent standards, it is appropriate to enquire why a problem is said to exist in that state.

Let us make a few points:

1. New Mexico has told a federal court that it could and would proceed to develop standards in a timely manner but for the "uncertainty" created by pending litigation. If the industry position in that litigation is found to be wrong, New Mexico has told the Court that its objections will be withdrawn.

2. There are still five months available until the statutory deadline.

3. New Mexico should have been able to start preparing to meet new standards long ago.

- NRC announced the preparation of its Generic Environmental Impact Statement on Uranium Milling over five years ago. 41 Fed. Reg. 22430, June 3, 1976.

- A draft of the document was issued over two years ago, in April, 1979.

- NRC's draft rules, which do not differ in most respects from the final rules, were issued almost two years ago. 44 Fed. Reg. 50012.

- NRC's final rules have been available since last October.

- NRC has met and corresponded actively with all the Agreement States, including New Mexico, on a frequent basis over this period of time.

What we may well be seeing is not a need for more time, but a desire not to adopt regulations equivalent to NRC's at all. This has certainly been what industry has urged the state to do in the strongest possible terms.

Congress has given a mandate to NRC to improve tailings control. It has given the states the same mandate.

Congress is free to change its mind and determine that improved tailings control is unnecessary. We do not believe that would be wise or justified in the circumstances.

Absent such a reversal of Congressional polity, there is neither a need nor justification for further delay. The Congress should value consistency, and should chart a firm course. Any sign of irresolution will open the floodgates for all kinds of pleas for piecemeal and unwarranted changes in the Act.

THE NEED FOR BETTER CONTROL OF TAILINGS

There is one matter, somewhat tangential, which must be addressed here. That is the question of whether there is indeed any hazard posed by uranium mill tailings.

It has been argued repeatedly by industry in recent months --to courts, to agencies, to legislators, and to the public--that the risks posed by tailings are so low, in comparison to many other risks that the public routinely accepts, that costs of improved tailings management are unreasonable or excessive. Therefore, it is argued, more time is necessary to study the question, improved tailings management is not requred, and no substantial expenditure of resources to protect the public is justified.

There are a number of things wrong with these arguments as they have been made. These include:

1. The degree of risk of fatal cancer from low levels of ionizing radiation is subject to very serious dispute. It is misleading, in view of this great uncertainty, to imply that any particular set of numbers accurately portrays risk. This issue is treated in greater detail below.

2. Arguments to date have focused almost entirely on fatal cancer rates, to the exclusion of fatalities from other diseases, and ignoring the serious problem of non-fatal disease.

3. Arguments have focused on radiation hazards to the exclusion of the significant nonradioactive hazards, such as contamination of ground and surface waters with heavy metals derived from tailings--molybdenum, selenium, cadmium, and others.

4. Arguments have focused on human health to the exclusion of economic costs of improper tailings management, such as rendering valuable water supplies unuseable, or making certain lands unsuitable for grazing.

5. The public has a right to distinguish between voluntary and involuntary risks. Driving cars, for example, is risky. Yet individuals generally drive voluntarily. Further, they believe they can reduce risks, by wearing seat belts, driving carefully, or being alert. In contrast, radiation risks are involuntary, and very hard for individual citizens to minimize or control. In short, we should reject the argument that improved tailings control is unwarranted because people drive cars.

Thus, there is ample reason for controlling tailings even if there were *no* risk of fatal radiation-induced disease.

But there are such risks. While it is misleading for anyone to suggest that these risks are precisely known, that does not mean that inaction is justified.

The question is this: in the face of both risk and uncertainty, how is the risk to be allocated between industry and the public?

It would, in our view, be irresponsible to take the position that no action is possible until risks are precisely known and there is complete scientific consensus on all matters. Rather, it is our task, using the best available information, to strike a reasonable balance between costs and benefits of controls.

In doing so, we should be guided by what is known about the effects of low level radiation.

LOW LEVEL RADIATION AND ITS HAZARDS

There is no question that there is a release of radiation into the general environment from tailings. In the long run, radiation releases from tailings are greater than routine releases from any other stage in the nuclear fuel cycle. As a result of being for all practical purposes a perpetual hazard, tailings represent the major threat of the nuclear fuel cycle.[1]

It is indeed hard to justify stringent limitations on the amount of radiation released from nuclear power plants if little control is exercised over releases from tailings. Either we would be imposing overly strict requirements on the power plants, or we would be concentrating on a few trees, losing sight of the much greater forest of tailings radioactivity.

In analyzing the risks of low level radiation, we start with uncertainty:

> reasonable men have disagreed by as much as a factor of 100 or more in their assessment of the risk from exposures to a single rad of sparsely ionizing radiation. . . .[2]

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[2] Land, *Estimating Cancer Risks from Low Doses of Ionizing Radiation*, 209 SCIENCE 1197 (12 September 1980) (attached).

Given this disagreement, it is hardly reasonable to provide specific numbers, to several decimal places, and to suggest that they represent some sort of accurate estimate of risk.

> These misuses of statistics have in common that point estimates of risk are evaluated with little or no regard to their precision. Because point estimates are imprecise when power is low, ignoring evidence about precision makes it easier to select data that appear to support a given point of view.[3]

NRC estimates that the radiation risk to an individual living at a ranch house 2.0 km downwind from a uranium mill "represents about a 0.13% increase in the natural risk from cancer" of premature death.[4] As pointed out above, (1) giving a single number such as this is misleading in view of the substantial uncertainties, and (2) the figure ignores fatalities from diseases other than cancer, and ignores nonfatal cancers.

Industry has argued in court that this risk--amounting to 13 additional fatal cancers per 10,000 people--is insignificant, and that the risk is in any case lower than NRC suggests.

We believe (1) that this risk is not insignificant, and (2) that the risk may very well be greater than NRC suggests. A few of our reasons for this conclusion are as follows:

1. Population density. Industry argues that very few people are exposed to the indicated risk, because the West is sparsely settled. Yet the West is growing and growing fast. The tailings hazard will persist for all practical purposes in perpetuity. In all probability, population in milling regions will be much higher in 20 years--let alone 100 years, 1,000 years, or the 1,000,000,000 years a House of Representatives committee found would be required for the hazard to abate.

2. NRC uses the "linear" dose-response relationship.

> With rare exceptions, estimates of cancer risk from low-dose radiation exposures must be based on information obtained by observing populations exposed to much higher doses.[5]

In order to estimate risks at low doses, it is therefore necessary to make some assumptions about how to extrapolate those data to low doses. The possibilities are:

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[3] Land, note 2 above, at 1199.

[4] NRC, Final Generic Environmental Impact Statement on Uranium Milling, p. 6-39 (1980).

[5] Land, note 2 above, at 1199.

a. that the relationship is linear--that exposure to 1 rad over 1 year produces the same number of health effects as exposure to .1 rad over 10 years;

b. that long-term exposure to low doses is less damaging per unit of radiation than short-term exposure to high doses;

c. that long-term exposure to high doses is more damaging per unit of radiation than short-term exposure to high doses.

In making its estimates, NRC uses the first of these approaches. There is, however, a growing body of scientific opinion that the third of these alternatives is in fact correct, at least with respect to alpha radiation.

For example, the National Academy of Sciences Committee on the Biological Effects of Ionizing Radiations has concluded that:

> Epidemiological and experimental data suggest that the effect per dose of alpha radiation at low dose rates . . . is greater than at high dose rates.[6]

Dr. Victor Archer, a noted researcher with over 20 years of experience in the field, concurs:

> For alpha particles . . . there is evidence that carcinogenicity per rad is substantially greater both at low doses and with protracted exposure periods than it is at high doses with short exposure.[7]

If these researchers are correct, then NRC's "linear" model understates risk.

3. The NRC averaged different techniques in developing its risk factors. Among the different figures NRC included in its risk estimation, there was, as could be expected, significant variation. NRC selected "central values" within these ranges.[8]

It is therefore possible, as NRC concedes, that risks are underestimated.

4. Recent research shows a possibility that some radiation risk estimators understate risk. As an example of the kind of uncertainty which surrounds radiation risk estimators, we have

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[6] National Academy of Sciences Committee on the Biological Effects of Ionizing Radiations, The Effects on Populations of Exposure to Low Levels of Ionizing Radiation, p. 188 (1980).

[7] Archer, Effects of Low-Level Radiation: A Critical Review, 21-1 NUCLEAR SAFETY 68, 75 (Jan-Feb 1980) (attached).

[8] Generic EIS, note 4 above, Table G-7.1, p. G-58.

attached a news article from SCIENCE, discussing the possibility that earlier risk estimators for gamma radiation may understate risk.

In conclusion, it is our position that any attempt to suggest that there are specific, generally accepted risk estimators which can give us a single number representing risk are inherently misleading. It appears that cancer risk may well be significant, particularly as population growth in milling regions occurs. Even the risk estimators used by NRC show a cancer risk large enough to be of serious concern. These factors may well understate risk.

In addition, we should be aware that:

(1) many people may be exposed to radiation from a number of sources. Mines, which are of course usually located near mills, also produce large amounts of radiation, which NRC refused to consider. There may be many mines and several mills in the same vicinity, leading to exposure and risk factors much higher than used by NRC.

(2) as stated above, losses of valuable groundwater to pollution, contamination of grazing land, and other economic and environmental costs are enough in themselves to justify better tailings control.

CONCLUSION

In summary, we make the following recommendations.

1. New Mexico has made no adequate showing of a need for an extension of the Act's deadline. No extension of the deadline is warranted.

2. There is a need for vigorous Congressional inquiry into the reasons for:

    a. EPA's failure to meet the Act's deadline for promulgation of standards for disposal of tailings at inactive sites;

    b. EPA's failure to meet the Act's deadline for active site standards;

    c. EPA's failure to meet the Act's deadline for the uranium mine waste study; and

    d. DOE's failure to designate "vicinity properties" for remedial action.

Estimating Cancer Risks from Low Doses of Ionizing Radiation

Charles E. Land

Summary. Disagreements about the somatic risks from low doses of ionizing radiation stem from two difficulties fundamental to the logic of inference from observational data. First, precise direct estimation of small risks requires impracticably large samples. Second, precise estimates of low-dose risks based largely on high-dose data, for which the sample size requirements are more easily satisfied, must depend heavily on assumptions about the shape of the dose-response curve, even when only a few of the parameters of the theoretical form of the curve are unknown.

We probably know more about the carcinogenic effects of ionizing radiation than about those of any other environmental agent. There is a wealth of epidemiologic information, some with good dosimetry and some for which we have only an estimate of average dose to all persons exposed. There is a vast experimental literature, the mechanisms of physical damage to cellular material that may eventually result in cancer appear to be reasonably well understood, and there is wide agreement on a general mathematical form for the relation between radiation dose and cancer incidence (*1-3*).

Perhaps for that reason, and certainly because of the undeniable benefits associated with the use of radiologic and nuclear technology, we have been asking difficult questions about the dose-effect relations for radiation-induced cancer. The answers to these questions are often unclear; in particular, reasonable men have disagreed by as much as a factor of 100 or more in their assessment of the risk from exposures to a single rad of sparsely ionizing radiation, like x-ray or gamma rays (*4*).

We have good information, and there is relatively little disagreement, about cancer risks from exposures to hundreds of rads, but except for fetal exposure we have very little direct information about the possible effects on human beings of a single rad. Most of the disagreement about low-dose risk estimates centers on attempts to interpret low-dose data, or to extrapolate to the low-dose range the relatively good information about risks from high-dose exposures. These attempts are severely handicapped by statistical difficulties that can be best understood by considering a number of examples.

Sample Size Requirements

We have little direct information about the carcinogenic effects of low doses of sparsely ionizing radiation because the sample sizes necessary to obtain such information are impracticably large. The sample size for adequate power to test for an exposure effect, and for adequate precision in estimating that effect, depends on the underlying cancer risk due to exposure. A smaller radiation dose corresponds to a smaller excess risk, and as the excess risk decreases, a progressively larger sample is required in order to detect it. For example, if the excess risk is proportional to dose, and if a sample of 1000 persons is necessary to determine the effect of a 100-rad exposure, a sample of 100,000 may be needed for a 10-rad exposure and about 10 million for 1 rad.

This relation, which has been discussed by Pochin (*5*) in the context of estimating the increased health risk to populations in areas of unusually high background radiation, follows from the fact that excess risk must be estimated as the difference between the estimated risk in a population exposed to higher than usual radiation levels and that in a population exposed to usual levels. As excess risk decreases, sample size must increase approximately as its inverse square to maintain statistical precision and power, a relation that holds roughly so long as the excess risk remains below about one-fourth the normal risk.

Another problem, which is tangential to the main theme of this article and which will not be discussed further, is that subtle sources of bias, such as small, consistent errors in the ascertainment or reporting of exposure or disease, and confounding by other risk factors, may be comparable in effect to exposure. Increasing the sample size cannot compensate for such bias, and may in fact add to the difficulties of maintaining strict control over the observations. On the other hand, when the excess risk due to radiation is high, such biases often can be safely ignored.

Statistical Precision and Power

The statistical precision of an estimate is indicated by the ratio of its expected value, the true excess risk δ, to its standard deviation σ. If δ/σ is as large as 10, the estimate is unlikely to be more than a few percentage points different from δ. Conversely, if the ratio is as small as 1, deviations of 100 percent or more from the true value are the rule.

Statistical power, the probability of getting a statistically significant result, also varies with δ/σ. Power is the chance of correctly rejecting a false null hypothesis, in this instance the hypothesis of no radiation effect. The usual hypothesis test rejects when the estimate is greater than some multiple of either σ or some estimate of σ. Power is high if δ/σ is large; if the ratio is small power is low and it is unlikely that the null hypothesis will be rejected.

The lower limit for power, given $\delta > 0$, is the hypothetical probability of rejection given $\delta = 0$, an arbitrary small number (for example, .05) which is one of the determinants of the rule for rejecting the null hypothesis. Because failure to reject the null hypothesis is likely both under the null hypothesis and for positive values of δ for which power is low, its occurrence does not constitute strong evidence for the null hypothesis. This is particularly true if power is low for effect levels expected according to other data. Thus the results of a study based on low doses of radiation are likely to be inconclusive; in effect, the study is likely to be regarded as a wasted effort.

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"Negative" and "Positive" Results

A negative estimate is not unlikely if power is low, and such a result can be interpreted, however improperly, as evidence that there is no excess risk associated with exposure to low-dose radiation, or even that such exposure may be beneficial. A more serious problem, because it is less well understood, follows from the fact that even when power is low, the chances of rejecting the null hypothesis are not negligible. If the lower limit for power is .05, and if the test rejects the null hypothesis whenever the estimate is greater than 1.645σ, for example, the probability of rejection is at least .05, whatever the value of δ/σ. But if $1.645\,\sigma$ is larger than δ, the estimate must also be larger than δ in order for the null hypothesis to be rejected. If all estimates received equal attention and if studies of large populations exposed to low doses of radiation were easy to do, this would present no problems, at least in the long run. Unfortunately, estimates of an effect are not very interesting if unaccompanied by evidence that the effect in fact exists, and it is a commonplace among scientists that "positive" studies—those in which the null hypothesis of no treatment effect is rejected—are more likely to be reported and published than "negative" studies, which tend to be inconclusive.

Large studies involve great effort and expense and for that reason are unlikely to go unreported; for the same reason, many possible effects tend to be investigated on the same body of data, and it is the statistically significant estimates that receive the most attention. A case in point is the recently reported investigation by Mancuso *et al.* of cancer mortality and radiation dose among workers at the Hanford Plutonium Works (*6*). These data have also been analyzed by several different investigators (*7-10*), and while the evidence for some effects, for example, lung cancer (*11*), is in dispute on methodological grounds, including adjustment for bias, all analyses obtain statistically significant estimates for two cancers, multiple myeloma and cancer of the pancreas. For these cancers, which are not among the more prominent effects seen in populations exposed to higher radiation levels, the estimates from the Hanford data are very high indeed, much higher than those obtained from other data (*12*). On the other hand, no excess is seen for leukemia, usually the most prominent of radiation-associated cancers. Understandably, public attention appears to have focused on the very high risk estimates obtained for pancreatic cancer and multiple myeloma and not on the absence of a leukemia effect, yet both findings are at variance with a considerable body of other data. With average doses of about 1 rem among exposed workers, and only 2200 deaths from all causes, the study is certainly one of low power according to current estimates of cancer risk from ionizing radiation, however, and the pattern of results is consistent with what might be expected from a study of low power.

Example: Breast Cancer

The following hypothetical example illustrates some of these points. Suppose that half of a sample of N women have received a single mammographic examination resulting in an average tissue dose of 1 rad to both breasts. Suppose the exposed and nonexposed women are otherwise comparable, that all were 35 years old at the time of exposure, and that there are 20 years of follow-up information with respect to breast cancer for each woman. The first 10 years are ignored as being too soon for any breast cancers induced by the mammographic examination to appear. About 1910 breast cancers per million women per year would normally be expected during the second 10 years (*13*) plus, in the exposed, about six additional cancers per million per year (*4, 14*).

The numbers of breast cancers observed in the exposed and nonexposed women, respectively, are approximately distributed as independent Poisson variates with respective means (and variances) equal to $\frac{1}{2} \times N \times 10$ times 1916×10^{-6} for the exposed and times 1910×10^{-6} for the nonexposed. The estimate $\hat{\delta}$, obtained as the difference between the numbers of breast cancers divided by the numbers of years of observation for risk, or $\frac{1}{2} \times N \times 10$ for each group, has mean $\delta = 6 \times 10^{-6}$ and standard deviation $\sigma = [(1916 + 1910) \times 10^{-6}/(\frac{1}{2} \times N \times 10)]^{1/2} = .02766/N^{1/2}$. For simplicity σ is assumed known, contrary to the usual situation, but because we are considering only very large values of N that is not misleading; the usual estimate of σ itself has standard deviation proportional to N^{-1}. For N greater than 10,000, $\hat{\delta}$ has approximately a normal distribution. Finally, we ignore the small difference between the above value for σ and that corresponding to the null hypothesis of no excess risk, $\sigma = .02764/N^{1/2}$. Accordingly, the calculations given below are based on normal approximations to the distributions of the estimate $\hat{\delta}$, with mean 6×10^{-6} and standard deviation σ, and the test statistic $T = \hat{\delta}/\sigma$, with mean $\delta/\sigma = .000217 \times N^{1/2}$ and unit standard deviation.

Under these assumptions the power of the test, as a function of sample size, is approximately

$$\text{Power}(N) = \Phi(\delta/\sigma - 1.645)$$

where Φ is the standard normal probability function. Power, graphed in the left-hand panel of Fig. 1, reaches the 50 percent level only when the sample size is about 60 million. For a sample of 10 million power is only 17 percent, and the probability of a negative estimate, $\Phi(-\delta/\sigma)$, is 25 percent. At N = 1 million, power is only a little above the minimum value of 5 percent and the probability of a negative estimate is nearly 50 percent, while with N above 100 million, where power climbs above 70 percent, a negative estimate is very unlikely.

The minimum value of $\hat{\delta}$ leading to rejection, $1.645\sigma = .04550/N^{1/2}$, or $45{,}500/N^{1/2}$ excess cases per million per year, is graphed in the right-hand panel of Fig. 1. The curve above it is the average of all values of $\hat{\delta}$ leading to rejection, given by

$$\delta + \sigma\,\phi(\delta/\sigma - 1.645)/\Phi(\delta/\sigma - 1.645)$$

where ϕ denotes the standard normal density function, the first derivative of Φ. Only when power is above 50 percent (at N about 60 million) is the minimum statistically significant estimate less than the assumed true excess, and only for N greater than about 100 million does the bias imposed by a policy of noticing only significant estimates drop below 25 percent. For a sample size of 10 million the upward bias is 218 percent (the minimum significant estimate is 139 percent too high), and at 1 million the bias is 866 percent (minimum 658 percent).

Case-Control Samples

Obviously a sample of 100 million women would be impracticable. On the other hand, the case-control approach, in which the sample consists of a fixed number of breast cancer cases and a fixed number of matched noncases, or controls, and in which cases and controls are compared with respect to frequency of exposure, also would require an impracticably large sample size. For example, if four controls were selected for each case and if about half of all women were exposed, about 600,000 breast cancer cases would be needed for power comparable to that from a cohort study of 100 million women (*15*). In the United States each year there are about 25,000 new cases of breast cancer among women between the ages of 45 and 54 (*13*) or about 1/24 the number required.

For studying larger average breast-tissue doses, assuming excess risk to be proportional to dose, disproportionately fewer women would be required. With the cohort approach, 1 million women would be required if the average dose were 10 rad instead of 1 rad, and only 11,000 would be required if it were 100 rad. Similarly smaller sample sizes would serve for the case-control approach.

Example: Leukemia

The very large sample size requirement of the above example is a consequence of the small expected radiation effect relative to the underlying breast cancer rate in the population. A smaller sample would be required for study of a cancer with a similar radiation effect but a lower population rate. For example, if instead of breast cancer in women exposed to a 1-rad breast-tissue dose, we consider leukemia in men of the same age with a 1-rad bone-marrow dose, followed for 15 years after exposure, the normal leukemia incidence of 44 cases per million per year might be increased by as much as three cases per million per year in the exposed group (*16*). The sample size required for this example is about 1/15 that for the breast cancer example, but it is nonetheless very large. A case-control study with approximately the same statistical properties as a cohort study of 16 million men would require about 1300 cases, assuming a 50 percent exposure rate and four controls per case (*15*). The number of cases required is a little over twice the annual number of new leukemia cases among U.S. men in the age range 35 to 49 (*13*).

Confidence Intervals

Many of the inference problems associated with studies of low power, as discussed above, are behavioral in nature and involve misuses of statistics. That is, if we report, or pay attention to, only those point estimates of excess risk that are significantly greater than zero, we introduce bias that can be considerable when power is low but that tends to be relatively unimportant when power is high. Similarly, the bias introduced by ascribing undue importance to negative estimates is serious when power is low but not when power is high. These misuses of statistics have in common that point estimates of risk are evaluated with little or no regard to their precision. Because point estimates are imprecise when power is low, ignoring evidence about precision makes it easier to select data that appear to support a given point of view.

A confidence interval is a range of values—here, risk values—that are consistent with the data. In contrast to inferences based solely on point estimates and the result of a single hypothesis test, inferences based on confidence intervals emphasize statistical uncertainty and are therefore less subject to biases like those discussed above. This can be illustrated in terms of the example used to construct Fig. 1.

Given $N = 10$ million women, there is a 17 percent chance that a statistically significant point estimate of risk will be obtained, and such an estimate can be expected to be 3.2 times as large as the true risk. The probability that the true value will be excluded from the 95 percent right-infinite confidence interval is only 5 percent, however, and the chances of excluding all values less than twice the true value is only 1 percent. These probabilities correspond to conditional probabilities, given statistical significance, of .29 and .06, respectively. The probability of obtaining a negative point estimate of risk is 25 percent, but the chance that all positive risk values will be excluded from a one-sided, left-infinite confidence interval of level .95 is only 1 percent; the conditional probability of this, given a negative point estimate, is only 4 percent. Thus the confidence interval approach discourages extreme interpretations of study results by reminding us that less extreme interpretations also are consistent with the data.

Curve Fitting

With rare exceptions, estimates of cancer risk from low-dose radiation exposures must be based on information obtained by observing populations exposed to much higher doses. The simplest way to do this is to scale down the estimated excess risk at a higher dose level, for example by assuming the excess risk at 1 rad to be 1 percent of that estimated at 100 rad. Theoretical considerations, on the other hand, and much experimental and epidemiologic data, suggest a more complicated relation between dose and cancer incidence. A model widely accepted as consistent with existing knowledge represents carcinogenesis by an upward-curving "linear-quadratic" function of dose having positive slope and curvature at zero dose, and the competing effect of "cell killing," a general term used here to represent a loss of ability of cell division by an exponential multiplier:

$$I(D) = (\alpha_0 + \alpha_1 D + \alpha_2 D^2)\exp(-\beta_1 D - \beta_2 D^2)$$

Here D represents dose in rad and $I(D)$ cancer incidence or cancer mortality. The parameters α_0, α_1, α_2, β_1, and β_2, all of which are assumed to be nonnegative, correspond to the following concepts: α_0, cancer incidence in the absence of radiation; α_1, excess cancer incidence per rad at low doses; α_2, additional carcinogenic effect of multiple, closely spaced ionizing events as compared to single ionizing events, by which high-dose exposures have more effect per rad than low-dose exposures; and β_1 and β_2, analogs of α_1 and α_2, but for cell killing instead of carcinogenesis. Visually, $I(D)$ is an S-shaped curve which if it has

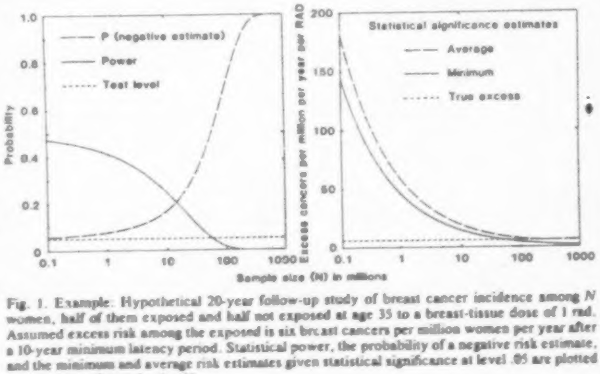

Fig. 1. Example: Hypothetical 20-year follow-up study of breast cancer incidence among N women, half of them exposed and half not exposed at age 35 to a breast-tissue dose of 1 rad. Assumed excess risk among the exposed is six breast cancers per million women per year after a 10-year minimum latency period. Statistical power, the probability of a negative risk estimate, and the minimum and average risk estimates given statistical significance at level .05 are plotted as functions of sample size N.

Table 1. Leukemia incidence among survivors of the Nagasaki atomic bomb and nonexposed controls, 1950 to 1971. [Data from Life Span Study sample (7, 9)].

Average dose to bone marrow (rads)	Person-years (PY) observation for risk	Leukemia rate per 10^4PY*	Estimated excess risk per 10^4 PY ± S.D.†
0	214,122‡	0.27	
2.1	128,288	0.48	0.21 ± 0.22
11.8	71,676	0.44	0.17 ± 0.27
38.9	25,643	0	−0.27 ± 0.71
79.0	27,355	1.86	1.59 ± 0.83
132	14,714‡	5.74	5.47 ± 1.98
186	5,415‡	3.51	3.24 ± 2.55
286	6,981	9.37	9.10 ± 3.67

*Adjusted to the age distribution of the entire LSS sample. †Standard deviation of rate minus zero-dose rate, assuming Poisson variation. ‡Numbers approximate, obtained by interpolation on year (16).

positive curvature anywhere has it at low dose levels and if it has negative curvature anywhere has it at high dose levels. α_0 is the zero-dose intercept of the dose-response curve, α_1 its slope at zero dose, and α_2 a constant multiple of the curvature near zero, while β_1 and β_2 correspond to the downward curvature at high dose levels (1-3).

Unfortunately, the dose-response curves observed for different cancers and species vary to such an extent that none of the parameters can be assumed known, nor can any two of these parameters be assumed to have a fixed relation to each other. The general model given above, with its five free parameters, is consistent with a large family of possible dose-response curves. Two such curves, for example, may agree closely at, say, 200 rad but disagree markedly on the amount of excess risk at doses under 10 rad. Thus the influence of high-dose observations on estimates of excess risk from low-dose exposures is limited. Simpler models, with fewer free parameters, correspond to much more restricted families of curves and impose more structure on the relation between excess risk at high doses and that at low doses. High-dose data, therefore, have more to do with estimates of low-dose risk than when a more general model is assumed. Only when low-dose data are extremely strong (and we have seen in the previous section that the required sample sizes may be very large indeed) is it possible to use models of great generality when the ultimate purpose is estimation of risk at low doses. Simpler models can be obtained by eliminating one or more of the parameters, or by other assumptions that reduce the number of free parameters.

Such assumptions, of course, are not without consequences. If the parameters α_2, β_1, and β_2 are set equal to zero, so that a purely linear dose-response model is fitted, the parameter α_1 retains its former meaning only if the linear model is assumed to be true. If, on the other hand, the linear model is used only as a first-order approximation to a dose response that is acknowledged to be more complex, the parameter α_1 is not the excess risk per rad at low doses but the average risk per rad over the entire fitted dose range.

A-Bomb Survivors

The Life Span Study (LSS) sample of Hiroshima and Nagasaki A-bomb survivors (6) is the largest and most detailed source of human dose-response data on radiation-induced cancer. These data are unique in having a wide range of estimated radiation doses, with the greatest numbers at the low end of the dose scale and with individual dose estimates accurate to within ± 30 percent (17). While the sample size is not nearly large enough at low doses for direct estimation of α_1 from low-dose data, curve fitting of general functions is much more feasible with these data than with data from other sources.

In the two examples presented below, four models—linear, linear-quadratic, linear with cell killing, and linear-quadratic with cell killing—have been fitted to age-standardized dose-response data from the LSS sample. The functional forms of the models are shown later in a table. All these models are simplified

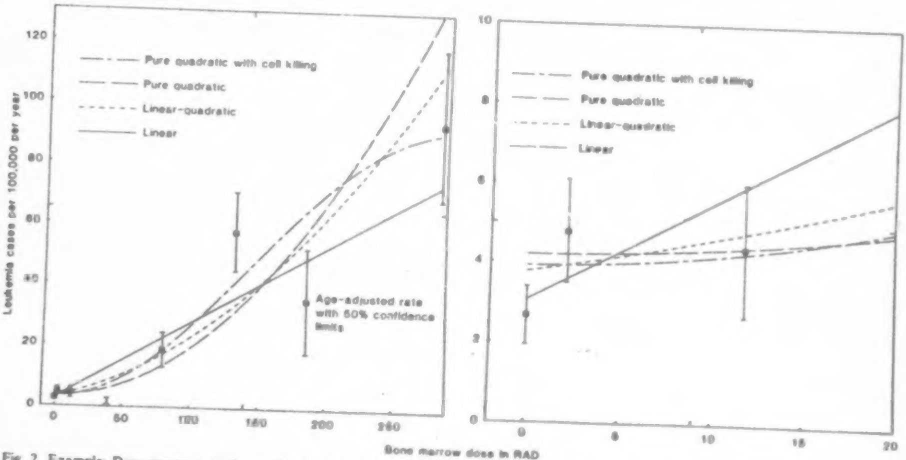

Fig. 2. Example: Dose-response analyses of leukemia incidence, 1950 to 1971, among Nagasaki A-bomb survivors. The right-hand panel is a detail of the left-hand panel. Age-adjusted rates are given with approximately 50 percent confidence limits. Fitted curves correspond to different dose-response models given in the text.

versions of the general model given previously. The linear model corresponds to a straight line; the linear-quadratic model to a curve with only upward curvature; the linear model with cell killing to a curve with only downward curvature, and that mainly at high dose; and the linear-quadratic model with cell killing to an S-shaped curve similar to that of the general model. (For the examples presented here, the linear-quadratic model with cell killing is very little different from the general model; either of the parameters β_1 and β_2 could be set equal to zero, and it was decided more or less arbitrarily to dispense with β_1.)

These simplified models all include a linear term, denoted by $\alpha_1 D$, which expresses most of the excess risk at low dose levels. It is more difficult to justify the use of a model without this term, since by omitting it one effectively assumes that the low-dose effects of radiation are negligible. Nevertheless, such models are favored by more than a few workers in the field, notably Rossi and Kellerer (*18*), as being consistent with radiobiological principles and with some experimental and epidemiological data. Two such models, pure quadratic and pure quadratic with cell killing, will also be fitted to sample data sets.

Table 1 and Fig. 2 show age-adjusted leukemia incidence rates by average bone-marrow dose for Nagasaki A-bomb survivors of both sexes, during the period 1950 to 1971 (*19*). Rates are shown with approximate 50 percent confidence limits as determined separately from each dose-specific rate. Data from the Hiroshima survivors are not included because the two cities show very different dose-response relations for leukemia; this difference is usually attributed to the substantial neutron component of radiation dose from the Hiroshima bomb. In the analyses presented below no account is taken of latent period or variations in radiation sensitivity by age at exposure, other than to adjust for possible confounding with dose. Therefore, the estimates pertain only to a population of similar age distribution observed over a similar time period following exposure (5 to 26 years).

In this example, the estimates of the parameter β_2 in the linear model with cell killing and of the parameter α_1 in the linear-quadratic model with cell killing were zero, under the constraint that all parameter values be nonnegative. That is, the best-fitting curves under these two models coincided with the best-fitting curves under the linear model and the pure quadratic model with cell killing, respectively (Table 2). Each of the models fitted the data adequately, according to chi-square values for goodness of fit, and none gave a statistically significant improvement in fit over any other. The standard deviations of the parameter estimates declined with increasing complexity of the dose-response model. The influence of assumptions about the dose response can be seen vividly in the estimates of excess risk at 1 rad, which ranged from .026 to 2.5 excess cases per million per year for models having a linear term in dose and down to .016 for the pure quadratic model (Table 2 and right-hand panel of Fig. 2).

Table 3 shows age-adjusted breast cancer incidence rates by breast-tissue

Table 2. Summary of curve-fitting analyses of age-adjusted leukemia incidence data.

Model and equation	Parameter estimate ± S.D.*	Analysis for lack of fit		
		χ^2	d.f.†	P
Linear $I(D) = \alpha_0 + \alpha_1 D$	α_1: 2.5 ± 0.6	6.9	6	.33
Linear-quadratic $I(D) = \alpha_0 + \alpha_1 D + \alpha_2 D$	α_1: 1.0 ± 1.2 α_2: .010 ± .008	6.3	5	.28
Linear with cell killing $I(D) = (\alpha_0 + \alpha_1 D) \exp(-\beta_2 D^2)$	α_1: 2.5 ± 1.0 β_2: 0 ± 8.4‡	6.9	5	.23
Linear-quadratic with cell killing $I(D) = (\alpha_0 + \alpha_1 D + \alpha_2 D^2) \exp(-\beta_2 D^2)$	α_1: 0 ± 1.8‡ α_2: .026 ± .028 β_2: 11. ± 11.	4.7	4	.32
Pure quadratic $I(D) = \alpha_0 + \alpha_2 D^2$	α_2: .016 ± .004	7.7	6	.26
Pure quadratic with cell killing $I(D) = (\alpha_0 + \alpha_2 D^2) \exp(-\beta_2 D^2)$	α_2: .026 ± .010 β_2: 11. ± 7.0	4.7	5	.45

*Estimate and standard deviation scaled by 10^6. †Degrees of freedom. ‡Boundary value estimate. Parameters constrained to be nonnegative. Standard deviation is approximately that of the negative estimate obtained by fitting the corresponding unconstrained model.

Table 3. Breast cancer incidence among female survivors of the Nagasaki atomic bomb, and nonexposed controls, 1950 to 1974. [Data from Life Span Study sample (*20, 27*)]

Average dose to breast tissue (rads)	Person-years (PY) observation for risk	Breast cancer rate per 10^4 PY*	Estimated excess risk per 10^4 PY ± S.D.†
0	149,365	1.70	
1.9	40,933	1.87	0.17 ± 0.76
5.6	38,769	1.75	0.05 ± 0.75
13.0	26,578	1.65	−0.05 ± 0.96
33.6	18,288	3.10	1.40 ± 1.34
70.8	15,962	2.09	0.39 ± 1.19
143.0	17,883	5.43	3.73 ± 1.77
240.5	5,844	10.68	8.98 ± 4.29
343.7	2,456	4.53	2.83 ± 4.31
585.6	2,394	11.13	9.43 ± 6.83

*Adjusted to the age distribution of the entire LSS sample. †Standard deviation of rate minus zero dose rate, assuming Poisson variation.

Table 4. Summary of curve-fitting analyses of age-adjusted breast cancer incidence data.

Model and equation	Parameter estimate ± S.D.*	Analysis for lack of fit		
		χ^2	d.f.†	P
Linear $I(D) = \alpha_0 + \alpha_1 D$	α_1: 2.2 ± 0.4	3.3	8	.91
Linear-quadratic $I(D) = \alpha_0 + \alpha_1 D + \alpha_2 D^2$	α_1: 2.2 ± 0.8 α_2: 0 ± .0024‡	3.3	7	.86
Linear with cell killing $I(D) = (\alpha_0 + \alpha_1 D) \exp(-\beta_2 D^2)$	α_1: 2.6 ± 0.6 β_2: 1.2 ± 1.4	2.8	7	.90
Linear-quadratic with cell killing $I(D) = (\alpha_0 + \alpha_1 D + \alpha_2 D^2) \exp(-\beta_2 D^2)$	α_1: 1.5 ± 1.5 α_2: 0.0084 ± .0109 β_2: 4.0 ± 2.8	2.6	6	.86
Pure quadratic $I(D) = \alpha_0 + \alpha_2 D^2$	α_2: 0.0062 ± .0024	9.4	8	.31
Pure quadratic with cell killing $I(D) = (\alpha_0 + \alpha_2 D^2) \exp(-\beta_2 D^2)$	α_2: 0.019 ± .005 β_2: 5.7 ± 1.6	3.0	7	.89

*Estimate and standard deviation scale by 10^6. †Degrees of freedom. ‡Boundary value estimate. Parameters constrained to be nonnegative. Standard deviation is approximately that of the negative estimate obtained by fitting the corresponding unconstrained model.

dose for female survivors in Nagasaki, 1950 to 1974 (*14, 20*). For all models except the pure quadratic the pattern was the same as with the leukemia data: all were in good agreement with the data, and there were no differences with respect to goodness of fit (Table 4). The pure quadratic model, however, could be improved upon by the addition of a linear term in dose, or by adding a term to allow for cell killing.

The leukemia and breast cancer data presented here are among the very best human dose-response data available linking cancer risk with exposure to sparsely ionizing radiation, such as gamma ray or x-ray. Although these data have been simplified by adjusting for differences with respect to age, only the simplest dose-response models yielded estimates for excess risk at low doses for which the standard deviation was less than half the value of the estimate, and there was enormous variation according to which simple model was assumed. In fact, there was far more variation between the linear and the pure quadratic model estimates for both breast cancer and leukemia than there was between estimates for the two kinds of cancers with either model; thus the choice of model can have more influence on the estimate of excess risk at low doses than the data themselves. Much of the current controversy about levels of risk from low-dose radiation stems from disagreements about which simple models should be used to obtain estimates.

Discussion

There seems to be no way to evade the problem of curve fitting and extrapolation from high-dose estimates of excess risk. We do not have the resources for adequate epidemiologic studies of populations exposed to low levels of radiation, and if we should try to do them anyway we would run considerable risk of obtaining misleading results, results that would derive at least some credibility from the vast effort of obtaining them.

Of course, no unexpectedly high risk estimates based on studies of populations exposed to low-dose radiation can be rejected out of hand. Each study must be evaluated on its own merits and in the light of other information. One such estimate, by Stewart *et al.* (*21*) of increased childhood cancer mortality following exposure in utero to x-ray pelvimetry, has received support from other studies, including one by MacMahon *et al.* (*22*) in which a number of possible biases that might have affected the earlier study were eliminated. A recent striking example of an unusually high risk estimate that did not hold up under examination was the finding by Najarian and Colton (*23*) of a marked tendency for cancer deaths among former workers at the Portsmouth Naval Shipyard in New Hampshire to be concentrated among former nuclear workers, whose exposures had been kept to fairly low levels. A reexamination of the data by Colton *et al.* (*24*), using employment records instead of information provided by next of kin, showed the earlier finding to have been heavily influenced by response bias, decedents having been much more likely to be identified as nuclear workers by their relatives if the cause of death was cancer than if it was something else.

It is to be hoped that experimental and theoretical work will narrow the range of possible dose-response functions in such a way that more efficient use can be made of existing and future data. In the meantime, simple dose-response models have their uses. An argument for the use of radiation gains credibility if benefit outweighs risk even according to a model which tends to give high risk estimates, such as the linear model with cell killing, and an argument against such use is helped if risk according to a model which tends to give lower estimates, such as the pure quadratic or even the linear-quadratic model, outweighs benefit. Also, the linear model may adequately represent the true dose-response relation over a restricted dose range, such as 0 to 100 rad. Thus large epidemiologic studies of populations exposed to between, say, 20 and 100 rad may represent a viable compromise betwen the direct approach and extrapolation from very high-dose levels.

Comparisons of human data from populations exposed to different kinds of radiation, or to radiation distributed differently over time, can also be highly informative. For example, much higher levels of excess leukemia risk have been observed among survivors of the Hiroshima bomb than among Nagasaki survivors with similar estimated dose levels (*18, 19, 25*). This suggests that neutrons may be more effective than gamma rays in causing leukemia and, according to widely accepted microdosimetric principles (*26*), implies that the leukemia dose-response curve for x-rays or gamma rays should have substantial upward curvature. According to this interpretation, linear model estimates obtained by curve fitting to data covering a wide range of gamma ray dose probably tend to overestimate excess risk at low doses. It does not necessarily follow that the pure quadratic model is correct; the above considerations merely suggest that the more general linear-quadratic model is preferable to the simple linear model. In fact, the existence of a densely ionizing part of all gamma ray tracks requires that the linear coefficient of dose should be nonzero (*2*).

A different situation obtains for breast cancer. Here the observed dose-response relations are similar for Hiroshima and Nagasaki survivors, suggesting approximate equivalence of effect for neutrons and gamma rays (*14, 20, 27*). The combined data from the two cities, without distinction between neutron and gamma ray components, are strongly linear, providing no statistical support for any of the more general models considered here (*14, 28*). It is interesting that the evidence in favor of linearity has become stronger with time, as more breast cancer cases have been observed in the LSS sample (231 in 1950 to 1969 against 360 in 1950 to 1974) (*14, 20, 27, 28*). Additional evidence in favor of linearity comes from a comparison of the A-bomb survivor data with data from two medically exposed populations, women given between 1 and 11 fairly high-dose x-ray treatments for acute postpartum mastitis (*29*) and female tuberculosis patients exposed to an average of 100 chest fluoroscopy examinations at biweekly intervals, with around 1.5 rad per examination, in conjunction with lung-collapse therapy (*30*). The breast cancer response to the highly fractionated fluoroscopy exposures might be expected to be linear in dose, on radiobiological grounds (*1*). That the average excess risk per rad should agree closely with that observed among the mastitis patients and the A-bomb survivors of comparable ages at exposure, in spite of the fact that the doses to the latter populations were delivered over relatively short periods of time, is difficult to reconcile with strongly nonlinear dose-response assumptions (*14*). This is an example of how largely high-dose data sometimes can be used not only to calculate low-dose risk estimates according to a simple dose-response model but also to justify that model as approximately correct.

There does not appear to be a single, simple dose-response model that applies to all forms of radiation-induced cancer. Except for special cases such as childhood cancer caused by fetal irradiation, for which the radiation effect appears particularly strong, it seems unlikely that it will be possible to solve the problem of estimating precisely the cancer risks from low-dose radiation without first solving the more complicated problem of determining the dose-response relations for particular cancers induced by radiation, over wide dose ranges. Paradoxically, it appears that in most cases there is more to be learned about cancer risks associated with low doses of radiation by studying populations with high and intermediate levels of exposure than by studying populations exposed only to low-dose radiation, even when the latter populations are very large.

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Federal Funding in Materials Research

James G. Ling and Mary Ann Hand

The relative merit of granting federal research funds to institutions rather than individual investigators has been a subject of controversy for some time. The recently formed National Commission on Research has included alternative funding mechanisms as one of the issues to be studied. This article summarizes the findings of a Mitre Corporation study performed between 1976 and 1978 on the Materials Research Laboratory (MRL) Program for the National Science Foundation (NSF). The study compared technical publications and other products of 16 MRL's, which had been funded with institutional grants, against similar material from individually funded research projects at 15 other universities (non-MRL's). Two universities funded with institutional grants by the Department of Energy (DOE) for materials research and two funded by the National Aeronautics and Space Administration (NASA) were also included in the study. In addition, the study compared total administrative costs (government plus university) per grant dollar for institutionally funded projects and those funded individually.

The primary objective of the study was to compare the effectiveness of institutional funding for MRL's with that of project funding for materials research. Emphasis was placed on the principal results and impacts of the MRL program since its inception in 1961, with particular focus on the period after NSF assumed sponsorship in 1972. Five investigators were involved in the study full-time for about 18 months.

Background of the MRL Program

The MRL program had its origin in the Interdisciplinary Laboratory (IDL) Program established in 1960 by the Advanced Research Projects Agency (ARPA) of the Department of Defense. The ARPA action was taken in response to a concern within the government that major hardware research and development programs were being impeded by the failure of materials technology to keep pace with needs.

Forty-five universities submitted proposals to establish IDL's, and 12 were selected. The funding arrangements with these 12 universities were designed to encourage stability and long-term university commitments. One key feature allowed the universities to make capital investments for IDL buildings and to be paid back over a 10-year period by ARPA through "building use" charges. A second key feature was that initial contracts covered a 4-year period. At the end of each year, contracts were renewed for an additional year, maintaining 4-year forward funding. This "block" or institutional funding approach, allowed the laboratories thus established to allocate funds internally to research projects rather than requiring them to request funds from ARPA on a project-by-project basis.

In July 1972, the IDL program was transferred from ARPA to NSF and renamed the MRL program. The term "block funding" was also changed to "core funding," highlighting the fact that other NSF funds, in the form of project grants, were available to support individual research efforts at the institutions. By 1976, NSF had added four new MRL's, and its funding for the MRL program in fiscal year (FY) 1976 was $14.6 million.

Two other federal agencies, the Atomic Energy Commission (AEC) and NASA, also established IDL's in the 1960's. The two IDL's originally sponsored by the former are now sponsored by DOE, and NASA continues to sponsor two of the three that it originally established.

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Environmental Effects

Edited by R. O. Chester and C. T. Garten, Jr.

Effects of Low-Level Radiation: A Critical Review

V. E. Archer*

[Editor's Note: In view of the continuing controversy concerning the biological effects of low-level radiation, the editors asked Dr. Archer to summarize the literature in the field. If the extensive data on mammals taken at high doses and dose rates are extrapolated linearly to dose rates near background levels, the effects are so small as to make statistically meaningful experiments impossible. If, however, low doses are much more effective on a per rem basis, then low-dose effects may be observable. Dr. Archer is of the opinion that he and other investigators have probably observed such effects. Although we have reservations about the validity of that conclusion, we are pleased to publish this comprehensive survey of the literature.]

Abstract: *Both negative and positive reports on the effects on man of low-dose and protracted radiation exposures are reviewed. Such effects are observable only in large populations by epidemiological techniques. Although not conclusive, there is considerable evidence to support the hypothesis that background radiation and artificial radiation in comparable doses probably have detectable effects on man. Certainly this is the prudent conclusion to reach. This means that nuclear power should be assessed on the basis of risk vs. benefit. The same type of assessment should be applied to nonnuclear power sources.*

Public opposition to the siting of nuclear power plants has become an important issue. Such opposition is based in part on a fear that environmental release of radionuclides would lead to cancer and genetic damage in the surrounding population. Is that fear justified? Does it reflect a nebulous fear of a new and unfamiliar hazard, or does it reflect a lack of faith in public officials who state that such facilities are safe? It probably reflects a little of both.

This review relates only to the effects of low-level radiation which might be associated with the normal operation of nuclear facilities, not to the possibility of sabotage, theft, or accidental release of radioactive material.

There is no question that ionizing radiation in sufficient dosage can cause a variety of somatic and genetic effects.[1–5] Many of these same effects are thought to also occur following low-level (below current exposure standards and near background) exposures.[6–8] The principal difference postulated is that, at low levels, the frequency of the effect is so low that it cannot easily be differentiated from normal disease.[8] It is impractical to use a sufficient number of experimental animals for such testing. However, sufficient numbers of people have been exposed at different levels of radiation so that sensitive epidemiological techniques might reveal effects.

Most types of injury which might be caused by low levels of ionizing radiation involve the genetic apparatus of cells.[9] Such injury to somatic cells may result in a variety of malignant diseases (leukemia, carcinoma, or sarcoma of any organ); to germ cells it may result in harmful mutations (congenital malformations and increased neonatal or fetal mortality). One characteristic of such injury to man is the long time between the occurrence of the injury and its manifestation. Induced dominant mutations may be seen in the first generation (but they are rare); the more common recessive mutations may not be evident for many generations; induced cancers may not appear for years or decades.[9] In chronic exposures the lower the exposure rate, the longer is this latent period.[10] Such time delays pose a difficult problem for epidemiology. They may also contribute a false sense of security because negative results are certain to be obtained when studies of exposed populations are made within 10 or 15 years after initiation of exposure. Two approaches—evaluation of chromosome aberrations[11] and watching infant mortality[12,13]—have been proposed as sensitive methods of circumventing the characteristically long latent periods. Their value for this purpose, however, has not yet been proven.

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This review does not include results from high-exposure studies, since they have been adequately reviewed elsewhere.[1–8] Those studies which sought to observe effects at low levels of exposure are reviewed below by groups.

STUDIES RELATED TO HANFORD NUCLEAR FACILITIES

A series of analyses have been done on the mortality of employees of the Hanford nuclear installation at Richland, Wash., or nearby residents.[14–35] The first suggested that there were excess deaths downstream on the Columbia River.[14] Another, using superior methods, found that suggestion to be false.[15] Milham,[16] using the crude method of examining death certificates in which Hanford was recorded as the workplace, reported an excess of cancers of the pancreas, lung, bone, and colon. This finding demanded further study. Several studies followed, all of which used proportional mortality methods.[17–23] They were based on deaths at the plant between 1949 and 1971. The earliest study used 841 death certificates, the number increasing to 3365 in the latest study. These studies tended to confirm an excess of deaths due to cancer of reticuloendothelial tissue and the pancreas and hinted that the excess might be associated with increased radiation exposure. The more sophisticated techniques of case-control studies and life table analysis were then used in attempts to determine the relation between radiation exposure and mortality resulting from cancer of those sites where an excess had been observed.[21–25] All of these studies noted a statistically significant association between external radiation and both cancer of the pancreas and multiple myeloma. In addition, one of the case-control studies reported an association between radiation exposure and neoplasms of the lung, pancreas, reticuloendothelial system, and all cancers.[21] From this data, doubling doses varying from 0.8 to 6.1 rads were calculated for neoplasms of different sites. A life table analysis that used a regression model calculated the doubling dose as between 15 and 30 rads.[24]

The more sophisticated of these studies have tried to control for, or evaluate, a number of complicating variables such as the age of the individuals or the age at, and time period of, exposure. However, few have been able to adequately assess or control the healthy-worker effect,[26] the influence of cigarette smoking, or other potential carcinogens in the workplace such as solvents or inhaled radioactive materials, medical radiation, radiation received before starting work at Hanford, the fact that cumulative radiation exposure tends to increase with length of employment regardless of cause of death, or the induction–latent period characteristic of radiation-induced cancer. The comparison groups, however, can probably be considered sufficient control for some of these factors.

It is likely that internal radiation, radiation received prior to Hanford work, and unmeasured radiation (such as neutrons) would be correlated with measured external gamma radiation because of the types of skills and activities involved. Such extra radiation would enhance the observed relation between exposure and certain cancers, and it would artificially decrease the doubling doses as calculated by Mancuso et al.[21,22] There is no reason to think that exposure to chemical carcinogens would be greatest among those with highest radiation exposure. The failure to consider the induction–latent period characteristic resulted in a loss of sensitivity in some of the analyses.

Although the results of these different analyses did not differ greatly, the conclusions drawn by the different investigators have been greatly at variance. One group contends that the findings are due to chance or to nonradiation factors (Refs. 17-20, 23, and 25); the other that radiation is almost certainly responsible.[21,22] The latter group has clearly used the more sensitive approach (the case-control study of Gilbert[23] lost sensitivity by matching on job category, which is associated with increased radiation exposure). Criticisms of the statistical techniques initially used by Mancuso et al.[27,28] have some merit but do not completely invalidate the findings.[24,29,30]

The two strongest arguments against regarding the findings as radiation effects are that leukemia has been thought to be the premier manifestation of late radiation injury and that the calculated doubling dose for cancers (0.8 to 6.1 rads) appeared unreasonable since the average exposure received by all people from background radiation is between 3 and 4 rads during the first 30 years of life.[31] This latter observation suggests that the minimum doubling dose for any cancer in adults would be 3 rads or greater. The argument related to leukemia is probably not valid, since multiple myeloma, rather than leukemia, was the principal type of malignant disease that increased among radiologists who started practice between 1940 and 1949 (Ref. 32). Their exposure was similar to that of the Hanford workers—relatively small doses spread over many years. Excess deaths from cancer of the pancreas could not have been predicted from the results of other studies, but they have been found to be associated with radiation. If background radiation causes a substantial fraction of cancer of many sites as suggested recently,[33] then doubling doses between 6 and 30 rads, as indicated by the most recent report,[24] would be reasonable.

OTHER STUDIES RELATED TO NUCLEAR FACILITIES

Several studies examined infant and neonatal mortality rates. Tompkins et al.[12] used quadrants of concentric bands about three nuclear plants to permit consideration of prevailing wind direction. Neonatal mortality rates were determined in 5-year groups. No association was found between operation of the facility and the mortality data. DeGroot[34] sought a relation between annual infant mortality by counties and effluent releases from four nuclear reactors using regression analysis. No association was found between the mortality and the effluent releases. Sternglass,[13] by selecting data from certain years and locations, claimed to demonstrate increased infant mortality in counties or states near nuclear plants. His conclusions, however, are doubtful, since, in addition to his selectivity, he failed to take into account normal statistical fluctuations, demographic variables, growth rates of developing areas, or local trends in infant mortality. Grahn[35] examined cancer mortality in eight counties surrounding a nuclear plant. He considered socioeconomic and demographic changes since 1950 and compared mortality for 10 years before and 9 years after the plant started operating. No associations between cancer mortality and the plant were found. Tokuhata et al.[36] compared death rates for leukemia, other neoplasms, and fetal and infant mortality rates in communities near a nuclear power plant with those in more distant ones. They found no associations between the mortality rates and the nuclear plant. Because of the many factors influencing fetal mortality, it is probably an insensitive indicator of radiation effect in man. Malignant-disease mortality associations in those studies were not only done in an insensitive manner, but were probably premature because of the prolonged latent period for radiation-induced cancer.

There have been four reports on mortality at Oak Ridge, Tenn.[37-40] Moshman and Holland[37] calculated age-standardized cancer-incidence rates that were generally lower than expected, presumably because most residents of Oak Ridge were immigrants who had been selected because they were young, healthy, and had specified skills (healthy-worker effect). Larson et al.[38] calculated expected deaths in three nuclear plants from 1950 to 1965 and compared them to observed deaths. Again, observed deaths were considerably lower than the expected deaths. Scott et al.[39] compared the mortality of those who worked with uranium at Oak Ridge National Laboratory and those who did not. They compared mortality in the two groups from 1941 to 1969 and found that both groups had lower than expected mortality but that the uranium workers had a lower mortality than did the non-uranium workers. It is not clear that those who work with uranium had the higher radiation exposures, although there were more clerical workers in the non-uranium group. Patrick[40] compared expected deaths with various specific age-adjusted causes of deaths occurring in the city of Oak Ridge and the two counties in which the nuclear facilities are located for the 1950 to 1969 period, using two approaches. The first compared mortality for the 14 years prior to establishment of the facility with mortality for the subsequent 29-year period. Several defects in this trend analysis were noted, but no significant differences in mortality trends were found between these three areas and the state of Tennessee. In the second approach, age-adjusted mortality for all cancer and for selected sites for the period 1950 to 1969 was compared to the expected rates for the two counties. The sexes and two racial groupings were analyzed separately. With the exception of leukemia and lung cancer among black females, there were no statistically significant differences between the observed mortality rates and the expected mortality rates in these two counties for total cancer, for leukemia, or for cancer of the lung, bone, or thyroid. The two significant findings were based on only two cases for each of the two cancer sites. It is not known whether these four individuals worked at the nuclear plants.

These four studies are best noted for the insensitive methods employed. Large groups of unexposed persons or recently hired individuals were included with exposed persons when comparisons were made. In some, the healthy-worker effect was ignored. In all but the study by Patrick, there was no attempt to look at specific causes of death. In only one of them was consideration given to the latent period; i.e., the deaths for the years when no excess cancers from radiation could be expected were combined with the deaths for later years when some might be expected.

Voelz et al.[41] compared the expected rates for cancer of selected sites with those observed for white males in Los Alamos County, most of whose residents are associated with the nuclear facility. There was a possible excess of malignant disease of the lymphatic and hematopoietic tissues and of the digestive tract. The radiation exposures of those individuals with malignant disease were not known. This situation is being studied further.

Two studies attempted to determine whether the uranium mill tailings used as fill under dwellings in Grand Junction, Colo., were having an effect on mortality there. Mason et al.[42] compared age-adjusted cancer mortality rates among whites for all cancer and for leukemia and lung cancer for the 1951 to 1967 period and compared the findings to Colorado rates. No excesses were noted. In the second study, Cunningham[43] used a case-control method and investigated the observation that leukemia in Mesa County, Colo. (Grand Junction is the county seat of Mesa County) had increased since the study by Mason et al. was made. He confirmed that the leukemia rate had increased since 1970, but he found no excess of leukemia cases associated with houses built on uranium mill tailings. Najarian and Colton,[44] in a preliminary study of death certificates of men who had worked at a naval shipyard where nuclear submarines were serviced, reported an excess of leukemia. However, this study has been criticized on the grounds of incomplete death data, internal inconsistency, and a failure to quantitate radiation exposure.[45] This situation is being studied further, using both case-control and cohort approaches.[46]

STUDIES OF THE EFFECTS OF BACKGROUND RADIATION ON MAN

Laboratory studies of the effects of very low levels of radiation have encountered a difficult problem: as the exposure rate and the total dose are decreased, larger and larger numbers of animals must be followed for longer and longer periods in order to detect the small effects. Predictably, such experiments at or near background radiation levels have been impractical. However, human populations that have been exposed to differing levels of background radiation may be found which satisfy both the criteria of size and of long-term observation. Such populations have their defects in that they may have uncontrolled exposure to mutagens and carcinogens other than background radiation and many have substantial mobility; but, nevertheless, they have a great potential for the exploration of radiation effects at very low levels. A number of such studies have been done, with about half yielding positive results. The negative ones will be considered first.

Bugher and Mead[47] found no relation between the frequency of bone sarcoma in the United States and their estimates of radiation exposure. An association between leukemia mortality and different measures of background radiation was sought without success by several authors.[48–53] Mason and Miller[53] sought, but failed to find, an association between the rates of all cancer (in addition to leukemia) and their estimate of background radiation based on altitude above sea level. Frigerio and Stowe,[54] used a multiple-correlation technique with groups of malignancies and 40 variables, including background radiation. They found no association with radiation. Grahn and Kratchman[56] found no association between all neonatal deaths and environmental radiation. George et al.,[57] Gopal-Ayengar et al.,[58] Freire-Maia and Krieger,[59] and Gianferrari et al.[60] found no association between possible effects and radiation exposure among populations living in high-background areas of India, Brazil, and Italy, respectively.

Leukemia, total mortality, and total cancer rates were unfortunate choices for seeking such an association. Leukemia was found to have a marked variability and to have an inverse association with aplastic anemia.[61] Its rates are highest in the industrialized nations, suggesting that much leukemia may be due to chemical agents. In addition, Archer[33] found that neither leukemia nor total cancer rates conformed nearly as well to estimated background radiation patterns as did cancer of some other sites. The many variables used by Frigerio and Stowe,[54] which could not be properly evaluated for each variation in radiation exposure, would seem to be an unusually insensitive method. Some of these studies used quantitative estimates of background radiation for each of the states in the United States. These estimates were probably misleading because they minimized the role of high linear-energy-transfer (LET) radiation. They failed to consider that low doses and protraction of high LET radiation probably enhance carcinogenic potency substantially. This point is discussed below. There are apparently too many other carcinogenic agents that contribute heavily to leukemia and total cancer patterns to expect anything but negative results from the above studies.

The study of all neonatal deaths combined, as Grahn and Kratchman[56] and others[34-36,40] have done, is another very insensitive approach, since it is likely that background radiation is associated with only a limited number of neonatal deaths, which comprise only a small proportion of the total number of neonatal deaths.[63-65] The failure of Gopal-Ayengar et al.,[58] Freire-Maia and Krieger,[59] and Gianferrari et al.[60] to find an association between any of their birth-associated parameters and background radiation, when others were able to do so,[62-65] is more likely due to inadequate methodology than to an absence of effect. Probably their most serious problem was in assessing exposure. When the population is mobile, an estimate of cumulative lifetime exposure for parents is likely to be much more important than an estimate of current exposure. Other problems may have been inadequate birth records, inadequate population size, and insensitive measuring parameters such as sex ratio, total congenital anomalies, or total neonatal deaths.

Studies that reported positive association between background radiation and an observable effect are of varying quality and cover several different effects. Kochupillai et al.[64] reported an elevated rate of Down's syndrome and related congenital abnormalities among a population living on thorium sands. Barcinski et al.,[65] Gopal-Ayengar et al.,[66] Kochupillai et al.,[64] and Verma et al.[67] reported increased chromosome aberrations in cultured lymphocytes among human populations or in plants living on thorium sands. Pincet[68] reported a correlation between human mortality due to tumors and natural radioactivity in food and water. Gentry et al.[69] reported an association between the incidence of congenital malformations and geologic formations ranked by their estimated content of radioactive material. Plewa et al.[70] reported a correlation between levels of background radiation and leukemia in Poland. Novak et al.[71] found an association between the incidence of malignant tumors and area measurements of gamma radiation in a Yugoslavian province. Wesley[63] noted a correlation between the incidence of fatal congenital malformations and horizontal geomagnetic flux (HGF).

Since the HGF tends to divert charged particles (primary cosmic radiation) away from the geomagnetic equator toward the geomagnetic poles, where the HGF is weakest, it may be regarded as a surrogate measure of cosmic radiation. Elwood,[72] in a multiple-correlation study, noted strong correlations between both latitude and longitude and the rate of anencephaly in Canadian cities. Archer[63] reanalyzed his data, showing that the primary correlation was probably with HGF and cosmic radiation. Archer[33] also showed a correlation between the cancer rate for a number of organs and HGF. He divided malignancy of various cancer sites into conforming and nonconforming sites. Cancer of the kidney throughout the world was shown to have a strong association with HGF.[33] Since cosmic radiation had been carefully measured at several sites in the United States, Archer calculated total background radiation and showed a strong correlation with the rates for cancer of the kidney and breast, averaged from six adjacent counties. Mortality from congenital abnormalities was similarly associated.[33] Since cosmic radiation increases with altitude above sea level, Archer compared the rates for cancer of several sites in Colorado (the highest state) with the average rate for 10 other states which have about the same HGF but are at lower elevations. The rates for cancer of conforming sites were significantly higher in Colorado than in the other 10 states.[33] Because variations in the gamma component did not seem to be large enough to account for the biological differences noted, Archer postulated that the high LET component (neutrons, pions, and alpha particles) of background radiation might be the most important factor in inducing cancer and congenital anomalies. The reasoning was (1) the efficiency of gamma radiation in inducing effects such as mutations and cancer declines with decreasing dose, whereas the efficiency of high LET radiation does not decrease and may increase at low doses and dose rates[73-75] and (2) the high LET component changes more with geomagnetic latitude than does the low LET component.[76] Since the cosmic-ray component is not the largest component of background radiation and its variation with HGF and latitude is not very great, Archer estimated that a majority of the cancers of conforming sites would have to be caused by background radiation for this effect to be apparent.[33]

Axelson and Edling[77] reported a preliminary case-control study in which persons living in rural stone or brick houses with basements were found to have a higher rate of lung cancer than persons living in wood houses without basements. The difference was attributed to the fact that lower levels of radon were found in the wood houses. Cigarette smoking was not fully investigated, but there was no reason to think that smoking patterns were associated with the type of dwelling. Ujeno[78] found an association between measured background radiation and stomach cancer as well as total cancer in Japan, but not with cancer of the lung, pancreas, large bowel, breast, or uterus. However, he was unable to consider age differences, migration, standards of medical care, or urban–rural differences.

The above studies that found an association between background radiation and a biological effect can be criticized for not having considered all relevant factors. Epidemiological studies rarely can. For instance, the reports on chromosome studies, congenital anomalies, and cancer rates did not consider possible differences in exposure to medical X rays or socioeconomic differences between populations. Gentry used a rather poor index of background radiation; Plewa, Gentry, and Novak used rather insensitive indicators of radiation injury. For the associations of congenital anomalies and cancer deaths with HGF found by Wesley and Archer, it should be noted that there are a number of other environmental factors that also vary in the north–south direction. Mean annual temperature, for instance, varies similarly and was shown by Lea[79] to have a similar correlation with breast cancer. In view of the many uncontrolled variables, which are likely to confuse things and result in negative rather than positive findings, as well as the relatively small differences in radiation exposure, it is surprising that so many of these studies had positive results.

STUDIES OF THE EFFECTS OF DIAGNOSTIC X RAY ON MAN

Because of the relatively large radiation doses involved, it is not surprising that increased rates of malignant disease were found among patients who had received therapeutic doses of X rays[80,81] and among radiologists.[32] However, radiation doses from diagnostic X-ray procedures are much lower, on the order of 0.05 to 5 rads. The relation of these doses to background radiation may be seen by comparing them to the estimate that the average person would receive about 100 mrems from background radiation per year, or about 7 rems during his lifetime.

Increased rates of cancer and leukemia were found among children who received radiation in utero when their mothers had diagnostic X rays for obstetrical reasons.[82] Stewart[83,84] showed that there was not only an increase in cancer rates, but also the cancer rate was directly proportional to the number of X-ray films that had been taken. These observations have been supported by a number of studies which found associations between leukemia and diagnostic X-ray exposure of the fetus[85–94] and among adults.[95–100] Some of them also reported a similar association for preconception exposure of the mother's ovaries.[85,89–91] One reported a change in menstrual problems and pregnancy rates among females when they had been exposed in utero to diagnostic X ray.[101] One reported the identification of a high-risk subgroup.[91] Bross et al.[102] used these subgroups, along with a statistical model, to calculate the risk from exposure to X ray at doses below 5 rads.[89,102] They concluded that previous estimates of risk from diagnostic X ray were low by a factor of 10. This approach has been strongly criticized by Boice and Land[103] on the grounds that estimates were treated as known constants and that "incorrect statistical manipulations" were used in connection with the complex model. Their reanalysis, however, confirmed an association of excess leukemia with diagnostic X-ray exposure of adults.[103]

Four studies either had equivocal results or failed to find an association between leukemia and diagnostic X ray.[104–107] It is likely that the populations in these studies were too small or there was too small a dose to reticuloendothelial tissue to expect positive results.

Increased rates of breast cancer have been repeatedly found among women following fluoroscopic examinations.[108–110] A dose-response relation, which is probably linear, has been shown.[107–110] A number of studies seeking an association between Down's syndrome (mongolism) and diagnostic X ray of patients were reviewed in 1970 by Wald et al.,[111] who concluded that radiation might be an important cause of Down's syndrome, but that more studies were needed. Their principal reservation was due to the fact that an excess of Down's syndrome had not been observed among the offspring of Japanese A-bomb survivors.[112] However, since then, three excellent studies, which considered known variables, have all found the association: Cohen and Lilienfeld[113] found that mothers who had been X-rayed had 1.5 times the usual risk of having a child with Down's. Alberman et al.[114] matched 465 parents of children with Down's with controls on age and time of birth. They found no excess of X-ray exposure among fathers, but there was a statistically significant excess of X-ray exposure among mothers of children with Down's when the X rays were received more than 10 years before conception. They concluded that recent radiation and radiation of fathers had little effect but that distant maternal radiation was quite important—that 2 rads would approximately double the risk of having a child with Down's syndrome. Uchida,[115] using a prospective method, found eight cases of Down's among the children of women who had abdominal X rays vs. one among controls—a statistically significant excess.

Alberman et al.,[116] using a case-control technique, compared the amount of chromosomal aberrations and radiation received by 845 mothers who had spontaneous abortions with matched mothers who had live births. The mothers who had abortions received significantly more diagnostic radiation than the controls. About one-fourth of the aborted fetuses had abnormal chromosomes. Mothers of the fetuses that had abnormal chromosomes received significantly more radiation than the controls.

Changes in the sex ratio of human offspring associated with parental radiation exposure has been reported a number of times,[117-120] but this ratio is considered to be a poor indicator of radiation effect in man because of the many variables (parental age, birth order, etc.) known to affect it.[121] Experimental data from animals have been used to predict genetic effects in man.[8] Generally, all radiation that reaches reproductive tissues is regarded as harmful, and induced mutations are proportional to the dose. One exception is that low LET radiations have a decreased effectiveness at low dose rates.[8] This decreased effectiveness may be the result of DNA repair mechanisms,[121] which seem to be partially effective against damage from low LET radiation but less effective against damage from high LET radiation. Such repair mechanisms, plus evidence from A-bomb survivors and animal experiments, have led some observers to conclude that there is little or no genetic injury to man at or near the usual environmental levels of radiation.[122]

Jablon and Miller[123,124] in two reports compared the cause of mortality of 6560 army radiological technologists with that for other kinds of medical technologists. The radiological technologists during training had practiced radiologic techniques on each other but averaged less than 3 years as such technicians. No statistically significant differences for individual sites of cancer or for deaths from other causes were noted when comparisons were made with the general population, but there was excess respiratory cancer among those exposed to radiation when the two groups were compared in the first report. In the second report this difference had disappeared, but there was a trend toward excess leukemia among the technologists exposed to radiation. Comparative cigarette smoking information on the two groups was not available.

A general life-shortening effect was noted among American roentgenologists, which was only partly due to excess malignant disease.[125,126] This was attributed to occupational exposure to radiation which was poorly quantitated. Other studies have confirmed the excess malignant disease among medical radiation workers.[32,127-130]

OTHER REPORTS ON LOW-LEVEL EFFECTS

Chromosome aberrations in cultured lymphocytes have been found in workers exposed to quite low levels of external radiation[11,131] and to internal radiation substantially below present permissible levels.[132-135] Although the study of chromosome aberration has replaced other blood studies for the detection of low-level-exposure effects, counting binucleated lymphocytes[136-138] and other parameters showed effects at quite low levels.[139] Although chromosome aberrations induced by radiation in blood cells are not harmful in themselves, they almost certainly reflect similar injury in other body cells. This type of injury to nuclear proteins is thought to be the basic mechanism for cancer induction. However, a definite relation between chromosome aberrations in blood cells and subsequent cancer has not been established.

Increased rates of lung cancer have been reported among underground miners exposed to radon daughter levels little above those encountered in many dwellings.[140-144] An increased mortality rate from childhood leukemia has been noted in Utah following exposure to fallout from nuclear weapons.[145] Although there is dispute as to the magnitude of radiation exposures, it appears to have been below 10 rads. Although etiology has not been firmly established, this observation appears to be consistent with the findings from diagnostic X ray noted above.

A biological effect on cell cultures at the surprisingly low dose of 0.3 to 2 mrads/h for 24 to 72 h was found in cultures of *Chlorella*.[146] They lost synchrony of multiplication at these exposures while controls did not. A somewhat similar study noted increased proliferation of *Paramecium* attributed to background radiation.[147] Increased chromosomal nondisjunction was found in aged mice at doses of 5 rads.[148] Two studies have reported findings in wild animals which suggested an effect from naturally occurring radiation exposures.[149,150] In a review, Grahn[151] noted several animal studies in which low-level radiation appeared to have been beneficial.

DISCUSSION

There is a surprisingly large volume of data in the literature on effects of low levels of ionizing radiation in man. However, quantitative effects at low levels are generally obtained by downward extrapolation from atomic bomb survivors or other groups with relatively high exposures.[8] Data from the atomic bomb survivors in Japan have given us much information on radiation effects, but the application of these data to the present subject is limited for two reasons: (1) the dose rate was extremely high—at the opposite extreme from environmental radiation, and (2) the extreme stress on survivors of the blast undoubtedly resulted in many nonradiation deaths and abortions. Such premature nonradiation deaths would almost certainly have an influence on subsequent mortality. Its effect could readily obscure the small radiation effects on the least exposed groups and on children, who could be expected to undergo the greatest stress. The effect of this stress may explain why results of analyses of childhood malignancies, Down's syndrome, and sex ratios in this group differ from other studies, as pointed out by Stewart.[84,152]

Much of the controversy over the effects of low-level radiation has centered about the question of whether linear extrapolation downward from high exposures to zero dose and zero response is a reasonable approach. Some contend that such procedures substantially underestimate the risk at low levels.[102,153,154] There is considerable animal data indicating that at low doses of beta, gamma, or X rays (low LET radiation) most effects per unit of radiation are substantially reduced,[8] leading some observers to conclude that linear extrapolation downward overestimates the risk at low levels. However, this effect may be counteracted to some extent by a protraction effect. There is some evidence that when small doses are administered over long periods of time (as with occupational or background radiation) some effects (including cancer) may be increased per unit of low LET radiation.[155-158] For alpha particles and neutrons (high LET radiation), there is evidence that carcinogenicity per rad is substantially greater both at low doses and with protracted exposure periods than it is at high doses with short exposure.[159-161] Judging from this data, it appears that linear extrapolation of the cancer dose-response curve to zero dose is a reasonable approximation for risk calculation for exposure to low LET radiation, but not to high LET radiation. Risk calculation for exposure to alpha particles and other high LET radiation is quite likely to underestimate the risk when linear extrapolation downward from high levels is used.

The above conclusions are consistent with data on breast cancer in humans, which suggests that the linear relation for X ray extends to low fractionated doses;[107,162] on human bone cancer, which demonstrated enhanced carcinogenicity of alpha radiation with protraction of dose,[163] and on lung cancer among miners exposed to alpha radiation from radon daughters, where cancers per rad are increased at low doses and low dose rates.[74]

Using the linear extrapolation technique and other theoretical considerations, up to 50% of observed human cancers might be the result of background radiation.[164] Archer, on the basis of observed correlations between cosmic radiation and cancer rates, suggested that between 30 and 50% of human cancers might be due to background radiation.[33] He also noted that lung cancer among nonsmokers is about what would be expected as a result of normal exposure to radon daughters.[165] There appears to be no inconsistency between theoretical extrapolation of radiation effects to background levels and the natural occurrence of cancer. Other calculations, however, are in substantial disagreement; e.g., the BEIR report[8] estimated that about 1% of human cancers are caused by background radiation. Such calculations appear to have grossly underestimated the role of the high LET component of background radiation as noted above. This underestimate, however, would have little influence on the calculation of population effects from the operation of nuclear power plants, since those effects are predominantly from beta and gamma rays. Fallout from some nuclear explosions, however, would contain substantial amounts of alpha emitters.

Since there is good evidence that effects in large human populations have been observed at average exposures of less than 10 rads, there is every reason to expect that background radiation, which is of the same order of magnitude when considered for a lifetime, will also produce observable effects, as suggested by a number of reports. Although the evidence is not conclusive that background radiation has an effect on man, it is sufficiently strong that the prudent course is to accept it as probably true.

Although data are sparse on genetic effects at low doses of radiation, the subject has been thoroughly reviewed,[166] with the conclusion that the genetic risk from any given whole-body exposure would be about

20 to 40% of the cancer risk. There is no reason to think that this fraction would be greater for low-level, protracted exposure.

Because of the many variables in human society which can affect the rates of malignant disease, birth defects, chromosome aberrations, Down's syndrome, etc., and the many pitfalls in data collection and analysis, it is not surprising that many of the studies noted above reported no observable effects. In this area of research it is probably much easier to obtain negative than positive results because the interfering factors (including inadequate population size) are more likely to obscure the association sought than to give spurious associations. With some exceptions, the positive studies have been the more sophisticated ones—those which considered more of the pertinent and possibly interfering variables, which used the more sensitive techniques, and which focused on specific effects rather than on broader ones such as total cancer or neonatal mortality rates.

Epidemiological methods appear to be the only way to approach the effects of low-level radiation on man. Such methods can rarely be used to "prove" a cause-and-effect relation because the epidemiologist can never control all possible variables as can be done in animal experiments. However, the large numbers of subjects with which he can deal usually minimize the effects of such variables. If they are varying randomly while the radiation exposure and effects are not, then all the uncontrolled variables do is decrease the sensitivity of the method. However, there is always the possibility that some uncontrolled variable will not vary randomly but will vary with the parameter one is measuring. This could result in spurious positive results. It is for this reason that little reliance can be placed on any single positive result. However, since the number of ways in which the problem has been approached has increased and has yielded positive results, one's confidence in the reality of observable effects in man from small exposures to ionizing radiation must increase.

One must realize that all of the earth's animals evolved in a radiation environment. Some of the background radiation effects may have been helpful (such as speeding up evolutionary changes), but most have probably been harmful. It is not likely that harmful radiation effects have appeared only with the onset of the atomic age. They are neither new nor different. We have always lived with them, just as we have always lived with injury from accidents and infectious disease. Just as we have developed immunologic resistance against infectious disease, we have also developed resistance to radiation, as noted above. It is unreasonable to ask that any industry eliminate all accidental injuries or to never allow anyone to develop pneumonia. It is equally unreasonable to ask that all radiation injury be eliminated. It has seemed reasonable to some people only because radiation injury has been recognized recently; it appeared to them to be a new and different plague visited on us by man's new technology. Most health risks are accepted reluctantly, although a few (like those from alcohol, cigarettes, and fast cars) are accepted willingly. Certainly, if the risk to workers in an industry is high and cannot be reduced to reasonable levels, the industry should be prohibited unless its benefits are very great. But when risks from accidents, radiation, etc., can be reduced to low levels, the most that can be asked of any industry is that it exert its best efforts to keep the risks minimal. The public must realize that radiation is not something new and different that should be forbidden, but an old antagonist that we long ago learned to live with—just as we have learned to live with bacteria and viruses.

Some of the studies noted above, especially those of Marks et al.[25] and Sanders,[20] serve to put the hazard from ionizing radiation in perspective. Regardless of whether one agrees with their conclusions, it is apparent that the effect of occupationally acquired ionizing radiation on the Hanford population has been very small. This is true even though more sensitive analytical methods may demonstrate an effect from radiation in that population. It is important that we maintain a reasonable perspective on radiation effects. One way of doing this is to calculate the expected radiation effects from occupational exposure and compare those effects with other commonly recognized hazards.[167-173] Using this approach, Pochin calculated that an exposure of 4 mrems/year (his estimate of the average dose per person from 1 kW of nuclear power) would result in about the same degree of health risk to an individual as that incurred by smoking one cigarette every two years or driving 64 km in a private auto each year.[167] These comparisons may seem absurd, but they do serve to put radiation risks from nuclear power in perspective. The risk of lung cancer from radioactive materials (radium, etc.) released to the atmosphere from a coal-fired power plant has been calculated to be 400 times greater than the risks incurred from using a plutonium breeder reactor of equivalent size.[172] The total health risks incurred from coal-fired power plants was calculated to be substantially greater than those incurred from equal amounts of electricity produced by means of nuclear reactors or natural gas.[173]

These estimates are based on linear extrapolation downward and do not consider possible effects from disasters that might occur from earthquakes, lightning, sabotage, nuclear accidents, theft of fissionable material, nuclear war, or inadequate disposal of radioactive waste. Such possibilities can be minimized by special precautions, but they cannot be eliminated. One can quarrel with the actual quantitative risk estimates obtained by these authors, and the numbers may be changed somewhat with additional quantitative knowledge on reactor emissions, on effects of low levels of radiation, and on the effect of air pollutants from coal burning, but they are most likely correct within an order of magnitude if one ignores the possibility of a large-scale nuclear accident. They serve the purpose of removing radiation hazards from the category of a nebulous unknown danger and putting such hazards in terms that can be understood.

If one considers the risk of large-scale nuclear accidents separately and considers that the published risk estimates are approximately correct, it is apparent that the small release of radioactive materials from the normal operations of nuclear reactors will cause little human injury when compared to the risk from other commonly accepted health risks—such as the risks incurred from automobile driving, cigarette smoking, and the burning of coal for heat or electricity. However, further research is needed on the effects of low levels of radiation as well as on the risk of nuclear accidents.

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JUN 25 1981 June 23, 1981

Bailey Guard
Committee on Environment
and Public Works
4204 Dirkson Senate Office Building
United States Senate
Washington, D.C. 20510

Dear Mr. Guard:

Enclosed you will find the written testimony of two persons, both of which were presented before the State of New Mexico Environmental Improvement Board regarding radiation regulations promulgated by the NRC implementing the Uranium Mill Tailings Radiation Control Act of 1978.

I understand from Paul Robinson of Southwest Center that hearings have taken place in Washington, D.C. by Senator Dominici on the Act of 1978 and New Mexico's responsibility to comply with NRC's new regulations. We understand that New Mexico was represented at those hearings, primarily by Environmental Improvement Division personnell. We would like to submit the enclosed testimony for the Congressional record as it is relevant to said hearings.

Please contact me upon receipt of the enclosed as we would like to ensure its inclusion in the hearings.

Thank you.

Sincerely,
Lynda Taylor
Lynda Taylor
Executive Director

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COMMENTS ON THE NEW MEXICO ENVIRONMENTAL IMPROVEMENT DIVISION'S PROPOSED ADDITIONS TO THE NEW MEXICO RADIATION PROTECTION REGULATIONS DATED APRIL 21, 1981

June 11, 1981

Submitted by:

Lynda Taylor
Executive Director

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My name is Lynda Taylor. I am Executive Director for Physicians for Social Responsibility. The following comments on behalf of that organization are in support of the New Mexico Environmental Improvement Division's Proposed Additions to the New Mexico Radiation Protection Regulations dated April 21, 1981. These proposed additions are based on the Nuclear Regulatory Commission's (NRC) regulations as mandated by the Uranium Mill Tailings Radiation Control Act of 1978, which will become effective for Agreement states including New Mexico on November, 1981. The Act is a federal effort to develop new and more stringent radiation regulations and operating procedures for uranium mills and we applaud those efforts. My comments are divided into two catagories:(1) Direct Responses supporting all of the regulations proposed by the EID and (2) Response to the Uranium Environmental Subcommittee of the New Mexico Mining Association comments made to the New Mexico Radiation Technical Advisory Committee on May 26, 1981 which attempted to reduce health dangers from radiation.

I. Direct Response to Proposed Additional Radiation Regulations

3-300-M:

We support this Section incorporating the technical Criteria of Appendix A to Part 3 which carry out the mandate of the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA).

3-300-N:

This section deals with the Environmental Protection Agency's new radiation standard for populations exposed to radiation from the nuclear fuel chain limiting annual whole body radiation dose to 25 mr/yr down from 170 mr/yr. Exhaustive research developing the basis for this new standard was reported in "Environmental Radiation Protection Standards for Nuclear Power Operations", 40 CFR, Part 190 prepared by the EPA in 1978. We support this reduction though radon gas and its daughters have been excluded and the 25 mr/yr standard for uranium fuel facilities has been based on hazards calculated over the next 100 years. Radon and daughters are the major problem in emissions from uranium facilities, and many of the radioactive elements released into the environment like Thorium 230 and Radium 226 will present a danger over the next several hundred to thousands of of years. Although the 25 mr/yr standard is more stringent than the previous 170 mr, the actual dangers that would accrue from radon and to future generations have been excluded or minimised.

Criterion 1:

This section deals with selection of alternative tailings disposal sites which would take into account remoteness from populations, groundwater impacts, erosion potential and dispersal of the tailings, with an overriding emphasis on isolating the tailings and associated contamination from populations and the environment for thousands of years. This is important as many problems exist with older sites that did not take these criteria into account. An example is the 1.5 million tons of tailings formerly owned by Kerr McGee in Shiprock which is located in the business district near schools, a daycare center, and restaurants. Radioactive particles have blown offsite and background radiation levels near the pile are above limits[1]. The tailings were also used offsite in the construction of roads, pavement, and in some homes. The new regulations governing location of future mill tailings piles and possibly some of the inactive piles are necessary to protect public health. A study by the EPA in 8/75 indicates that uranium tailings at many sites have spread to the environment and hundreds of acres of land have been contaminated to above-background levels[2]. Also, abandoned tailings piles which are high priorities for remedial action under the DOE's Remedial Action Program because of location near populated areas and waterways will have to be disposed of or stabilized at the expense of the taxpayers - not the industries that have created them. States pay 10% and the federal government picks up the other 90%. Adoption of this criterion would hopefully prevent this from happening in the future.

Criterion 2:

We support the proposal that byproduct material from in situ extraction operations be disposed at existing large mill tailings disposal sites. Many Navajo families, unaware of the dangers of radiation, utilized mine wastes from hundreds of small abandoned mine sites near Red Valley and Shiprock. Gamma radiation levels in at least 60 homes in that area exceed standards by severalfold and a campaign by the Navajo Tribe has begun to relocate many of those families residing in the radioactive homes[3]. Children have been known to play in these mines and on mine heaps. As in situ mining and extraction becomes more popular with industry, we could have similar problems, such as Mobil's in situ project in Crownpoint, a relative large population center which is growing rapidly. We support adoption of this criterion which would prevent the use of uranium waste products in building materials or access to children.

Criterion 3:

This section deals with disposal of tailings "below grade" as a prime option, although not mandatory. Gulf was recently granted a mill license by the state EID with a design for below grade disposal of tailings, including mine backfill, indicating this method is practicable. Problems with above grade disposal have been numerous. The United Nuclear Churchrock mill tailings accident in July of 1979 might have been averted with below grade disposal. Design and maintenance problems of this pile were exaccerbated due to its above grade storage and close proximity to a waterway, thereby spreading the contamination all the way to Arizona via the Rio Puerco. The clean up porgram has cost state and federal taxpayers, once again, over $500,000, for a retreival rate of less than 1% of the total volume of the spill[4]. Many of the other accidents involving releases of radioactive material from uranium mill tailings could have been avoided with the below grade design. Therefore, we support this criterion.

Criterion 4:

We believe the site and design criterion listed in this section which will provide reduction of rainfall catchment, wind protection, minimum erosion, vegetative or rock cover to reduce radioactive dispersion and consideration of geologic settings to ensure long term integrity of the tailings piles are necessary, particularly in the case of above grade disposal.

Criterion 5:

This criterion provides specific methods to deal with potential groundwater contamination from uranium mill tailings, both radioactive elements and heavy metals found with tailings. Provision is also made where groundwater has already been contaminated due to tailings seepage. Although specific seepage control and groundwater protection methods will be worked on a site specific basis, the goal of restoring groundwater quality to its potential use before milling operations began is important from a health perspective. In 1975, the Environmental Protection Agency reported on instances near uranium districts where groundwater has been contaminated above the limits set for radionuclides and heavy metals[5]. A few recent examples of water contamination include United Nuclear's mill at Churchrock where contaminated liquids have been seeping into groundwater at a rate of of approximately 80,000 gallons per day, although that rate may be lower now; Kerr McGee's uranium mill at Ambrosia Lake where monitoring wells have measured several hundred pCi/l for radium. The current standard for radium in water is 5 pCi/l, although Peterson, etal[6] has shown even 4.7 pCi/l in drinking water of a population in Illinois has elevated rate of bone cancer mortality. Also, domestic wells downstream from United Nuclear-Homestake Partners' uranium mill after a tailings pipe break in 1978 contained up to 3.4 mg/l of selenium, over 300 times the EPA Drinking Water Standard[7]*. The normal rate of selenium in water in the Grants Mineral Belt is generally 0.01 mg/l or less. The residential water supply utilized by subdivisions of Murray and Broadview Acres beside UN-HP's mill has been declared unfit for consumption and this contamination has placed the water supplies downstream in Milan and Grants at high risk. Selenium is an extremely toxic heavy metal which has been shown in association with miscarriage[8] and progressive neurological disorders among humans[9]. A study by Kaufman[10] demonstrated that seepage of mill tailings at active mills in Ambrosia Lake and Bluewater contributed an estimated 2400 curies of uranium, radium and thorium to the groundwater resevoir. Compare this with just the maximum permissible body burden of radium alone - 0.1 microcurie or 1/10 of one millionth of a curie. We support this criterion which would protect future groundwater use and provide action to alleviate such groundwater contamination as I have outlined.

Criterion 6:

This criterion calls for sufficient earth cover, but not less than 3 meters or 10 feet, be placed over tailings or wastes at the end of milling operations to reduce radon exhalation rates to less than 2 pCi-m^2-sec. Although the industry finds this 3 meter limit extraordinarily high, the Environmental Protection Agency has indicated that 6 meters or 20 feet of earth cover are required to reduce radon by 90%[11]. The EPA reported in June of 1976 that ambient radon levels in the Grants Mineral Belt are much higher than background radiation and are due to mining activities[12]. The 2pCi/m^2-sec described here is approximately twice natural background rate of radon. Pohl[13] has calculated, using EPA models, that the natural background rate of radon is generally 1 pCi-m^2-sec and accounts for approximately 4,000 lung cancer deaths a year, or 8% of the total lung cancer deaths which is 50,000 per year. Pohl then went on to calculate that radon from tailings piles through the year 2,000 will result in 45 extra lung cancers per year, or 1% of that caused naturally by radon. In a seperate but related study done by Axelson of Sweden[14], very low levels of radon and daughters (approx. 1.9 pCi/l) in homes have shown a statistical increase in lung cancers in residing families. The Oil Chemical and Atomic Workers Union in April of 1980 filed a petition with the Dept. of Labor calling for an immediate emergency reduction in underground miner exposure to radon based on recent studies indicating radon is more hazardous than previously acknowledged and levels within standards were contributing to excess lung cancers in miners[15]. In light of these health risks from radon and the existing contamination, we support this criterion which would lower the exhalation rate and protect nearby populations.

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*(10 micrograms/liter)

Criterion 7:

A preoperational monitoring program which would gather baseline data on a uranium milling site and its environs is long overdue and we support this criteria. Industry has been able to avoid strict enforcement of their radiation emissions because in many cases the State of NM has been unable to determine whether radiation is from background or due to uranium activities. The International Commission on Radiological Protection has recommended that standards for radiation be set to include radiation from background sources. However, both the NRC and the State have opted for standards which do not include background radiation; hence the lack of background radiation data in New Mexico has previously resulted in lack of enforcement, admitted by the NM EID.

Criterion 8:

Applying the principle of As Low As Reasonably Achievable to operations of any facility, including emissions from uranium mills is not new. ALARA has been incorporated by every major radiation standard setting body including the ICRP, NCRP, the NAS-BEIR and the NRC. ALARA was based on the recognition that any dose of radiation, no matter how small, was capable of increasing the risk of cancer or genetic effects, and standards would be a maximum level permitted with industry urged to keep radiation exposure well within these levels. Typically the industry has not been favorable toward ALARA and oftentimes suggest that the maximum levels of radiation are "safe". Implementing the concept of ALARA to uranium mills emissions is important. A preliminary study by Archer, etal[16] indicated a four-fold increase in cancer of the lymphatic system, probably due to stack emmissions. Controlling emissions from uranium milling facilities at the stack is not only practicable but highly efficient. A dramatic reduction of emissions rate at United Nuclear's Churchrock Mill resulted from minor modifications on packaging stack ventilation and cleaning systems. The reduction was from approximately

0.19 lb of U308/hr to 0.005 lb of U308/hr[17]. This process would indicate meeting the earlier discussed 25mr/yr standard set by EPA governing uranium mill emissions except radon would pose no problem to the industry - although they have voiced strong criticism over any reduction. Also, health hazard assessments to populations near uranium and nuclear facilities have been calculated by the Nucluear Regulatory Commission using mathematical models, as opposed to using site specific emission data. A team of West German scientists reviewed the world literature on NRC models used in calculating transfer of these radioactive elements released from the Nuclear fuel chain through the food chain and found the radiation risk has been underestimated by a factor of anywhere from 10 to 1000 fold[18]. In light of this information, we support criterion 8 and reducing air-borne releases which will end up in the food chain from uranium milling activities.

Criterion 9:

We support this criterion requiring a surety bond for decommissioning and decontamination of mill sites. The federal and state taxpayers, as mentioned before, are now carrying the financial burden of decontamination and permenent disposal of millions of tons of radioactive tailings throughout the country because uranium companies in the past were not held liable for tailings disposal. In order to protect the public and government from the possibility of a licensee inability to perform the required decommissioning and reclamation work, NRC regulations require that such surety should be secured by a bond to remain in full force and effect until the required work is completed. Otherwise, there will be nothing to prevent surety companies from cancelling the arrangements when the financial stability of the licensee became questionable or at the end of milling operations when assurance is most needed. In addition, licensee cost estimates shall take into account the total costs (adjusted for inflation) that would be incurred if an independent contractor were hired to perform decommissioning and reclamation of the area disturbed. Terms should be open ended so that if companies go bankrupt, etc. costs would not be passed on to the taxpayer. Surety should not be cancelled until work is completed according to NRC cleanup criteria.

Criterion 10:

We support criterion 10 which calls for final disposition of tailings or wastes at milling sites in accordance with Parts 1,3,4, and 12 of these regulations, the goal of which would require no ongoing active maintenance and provides for annual site inspections to ensure integrity of such disposed wastes.

Criterion 11:

We support criterion 11 which requires the transfer of land ownership to the state or federal government at time of licensing. The land transfer ensures isolation of tailings, ongoing surveillance and long term control of tailings in order to comply with the state and federal regulations after operations cease.

II. Response to the Uranium Environmental Subcommittee Statement to the NM Radiation Technical Advisory Committee on May 26, 1981 regarding health effects of radiation.

The Uranium Environmental Subcommittee claimed the NRC has greatly overestimated the health risk outlined in the proposed regulations because it based the regulations on a linear, non-threshhold approach for radiation exposure. It was argued that "Scientific justification does not exist" for the linear hypothesis, indicating that the industry believes in a threshhold for radiation below which no damage would be expected. I would like to relate a brief history of the linear hypothesis, showing enormous scientific support for the same. I will also discuss new radiation studies which indicate risks are even greater than the linear model and discuss preliminary data on health problems being discovered in the mining districts of New Mexico.

History of Linear Hypothesis

The linear, non-threshhold model has been adopted by every major radiation standard setting agency in the world, including the ICRP, the NCRP, the NAS-BEIR III, and UNSCEAR, all of whom represent the views of a large number of scientists in the field of radiation and health physics. Prior to about 1960, many health physicists and radiobiologists believed there was a threshhold dose for radiation, that is a level of radiation below which no health effect would ensue. However, an overwhelming number of studies failed to give evidence of any safe threshhold dose but rather have supported a non-threshhold dose effect relationship, following the linear model.

The current radiation standards are based on estimates of cancer risk derived from studies of some 82,000 survivors of the atomic blast at Hiroshima and Nagasaki and of groups of people who received therapeutic X-ray treatments. Many of these individuals received relatively high doses of radiation, a situation very different from environmental and occupational exposures occuring at low doses over a long period of time. Low dose estimates made in the 60's which form the basis of our radiation standards had to be extrapolated downward from the high dose rates suffered by the Hiroshima and Nagasaki survivors. Two ways were suggested in which the high radiation doses might be extrapolated to low doses. For high energy transfer radiation (high LET) such as Alpha, the risk declined with dose in a linear, straight line fashion down to zero dose when plotted on a graph. For low energy transfer radiation (low LET) such as Beta or Gamma radiation the risk to those survivors seemed to fall off more more quickly at low doses. Thus, the assumption was made that the linear extrapolation would be conservative because it would provide a margin of safety for public exposure at low doses. Again that was in the 60's. Many health physicists and scientists are now saying that the linear extrapolation is not conservative at all, but rather the risks at low levels of radiation are much greater than the extrapolations indicate. Dr. Karl Z. Morgan, referred to commonly as the Father of Health Physics and former Director of the Health Physics Division at Oak Ridge National Labs is onethat believes the linear hypothesis does not accurately portray risk at low levels and gives several reasons[19] (1) extrapolation from the high doses of atomic bomb survivors does not take into account that many who were injured by large doses of radiation did not survive long enough to die of cancer or other effects under study;(2) there is not a long enough follow up period which would have waited for the long latency periods of some cancer to show. Many cancers appear long after a study is completed and are not calculated into the study, such as the case with the atomic bomb survivors, which minimized the risk of radiation; (3) Cell sterilization may take place at high doses such that many cells that are likely targets for origination of a malignancy are destroyed, where as with lower dose rates cells survive in the damaged state and are most likely to be the precursor cells of a cancer.

More recently, studies of low level radiation exposure indicate that the linear hypothesis does not provide any margin of safety for certain age groups. These include the studies of luckemia as a result of in uteral X-ray exposure[20,21] and exposure to young people[22,23,24], all of which suggest that the fetus and the very young members of a population are radiosensitive and the linear hypothesis applied to them is not conservative even for low energy transfer radiation.

Similarly, the recent BEIR committee reviewed the linear radiation dose-response relationship and has concluded that for high energy transfer radiation such as from internally deposited Alpha emitting radionuclides, that model leads to underestimates of risks. They found that the risk actually follows a supralinear curve and that Alpha radiation doses are more "effective" in promoting cancers at lower doses because of their relatively large size and density. The report was based on data obtained on uranium miners and exposure to radon daughters which are primarily Alpha emitters.

Also, the National Institute for Occupational Safety and Health released a report in July of 1980 which reviewed world literature on risks to underground miners. That conclusion of that report was as follows: "Although the exact magnitude of the risk of lung cancer is not precisely quantified at this time, the fact that excess risk of lung cancer is greater than two fold at levels below 120 CWLM is cause for major public health concern." 120 CWLM is the current radon/daughter standard for miners over their lifetime, yet studies have been done indicating miners exposed to levels of radon/daughters in the range of 30-50 WLM were increasing lung cancers[25,26]. It is now recognized by major standard setting bodies that high energy transfer radiation such as Alpha produces a radiation effect in a supralinear curve.

In addition, there are nurmerous studies showing a significant increase in cancer following low energy transfer radiation exposures far below the limits, supporting the notion that the supralinear curve may apply to low energy radiation as Morgan reported. These studies include the controversial Mancuso follow up of Hanford Nuclear workers where the rate of pancreatic cancers and multiple myeloma was found in excess among workers exposed to radiation within current limits[27]. Irwin Bross showed subgroups of children in the population who are many times more sensitive to radiation exposure than others. He found that children with allergic diseases such as asthma or hives have a 300-400 percent increased risk of dying of leukemia compared with other children and children whoreceived in utero diagnostic X-ray exposure have a 40-50 percent increased risk of dying of leukemia. But children who were exposed to radiation in utero and later developed an allergic disease like asthma have a 5,000 percent increased risk of dying of leukemia[28].

These and other studies showing greater risk of radiation at lower doses have come under heavy fire from critics who staunchly support the linear hypothesis as being conservative and are quick to say these studies are contradicted by the data on the survivors of the atomic bombings at Hiroshima and Nagasaki. Unfortunately for those who have long believed in those extrapolations new data reported in Science Magazine this month[29] may shock them out of that belief. These findings indicate the radiation doses at Hiroshima and Nagasaki were miscalculated, resulting in an overestimation of radiation doses to those survivors by a factor of 6 - 10. This alarming news lends the most credibility yet that radiation doses at low levels do greater harm than originally thought. Much lower levels of radiation at Hiroshima were actually responsible for the cancers and other health effects there as opposed to the once-believed high doses. One need not extrapolate anymore from those high radiation doses to low doses. This information puts the Hiroshima and Nagasaki data on the same side of the studies that have shown similar increases in cancers and leukemia from small doses, lending support to the studies of Mancuso, Bross, Stewart, Lyons, and many others who have for too long been criticized for their findings. This new data on radiation at Hiroshima will necessitate the rewriting of many basic documents on the hazards of radiation, striking a major crack in the current foundation of radiation standards worldwide. Edward Radford, Chairman for the BEIR-III report on the Effects of Radiation now considers his Committee's report obsolete and expects that the probabilities it gives for the risk of dying of cancer after exposure to gamma radiation will be doubled and probabilities for contrating any form of cancer after irrdiation will be quadrupled. The BEIR reports are utilized throughout the world for the bases of radiation standards and risk assessment to workers and population.

In summary, it is the Uranium Subcommitte which has totally refused to look at any of the new data which has come into existence over the last 20 years or so, holding on to the long thrown out concept of a threshhold for radiation and making claims that the linear hypothesis, now superceded by even newer scientific evidence, has no scientific basis for setting the new regulations before us today.

Preliminary Studies Showing Correlation Between Birth Defects, Cancers, Altered Sex Ratio and ELevated Radiation Levels in Mining Areas of New Mexico

There have been several informal reports throughout the Navajo Reservation area near uranium mining and milling districts which have not been given enough careful followup and should be looked into by the EID of the Health and Environment Dept. Lynn Olcott, Associate Director of the Dine (Navajo) Center for Human

Development at the Navajo Community College works with hanicapped Navajos. She has noticed an overwhelming demand for service to handicapped children from two areas on the reservation - Tuba City and Shiprock - both towns being the sites of two huge abandoned radioactive mill waste piles as a result of intensive mining and milling activity since the early 50's[30]. Dr.Donald Calloway, a statistician with the Navajo Health Authority has also analysed data gathered by the New Mexico Tumor Registry and the Indian Health Service. His preliminary findings, released on March 30, 1981 at a Navajo Health Authority Conference in Tsaile, Arizona show a serious increase in bone cancer and reproductive cancers in children under the age of 15 on the Navajo reservation[31]. He found cancer of the ovarium and testicles among Navajo children at least 15 times the U.S. average, and bone cancers five times the U.S. average. The Community Health Representative Program of the Indian Health Service at Shiprock in the summer of 1980 conducted a survey of uranium mining families as compared to non-mining families following a series of concerns raised over the seemingly high number of birth defects in that former mining and milling area. The survey, using approximately 50 mining and non-mining families showed a two-fold increase in spontaneous abortions, stillborns, and congenital abnormalities in children of the mining families[32]. This survey has now formed the basis of a two-year follow up study in the Shiprock-Red Valley area, funded in part by the March of Dimes.

Additionally, a conference sponsored by the Dept. of Family Community and Emergency Medicine, UNM School of Medicine, was held on the Reproductive Effects in the Four Corners Area on February 27, 1981. There, a report made by Dr. Al Goodman showed that the sex ratio pattern has been altered in the Four Corners Area. Normally there are more male births than females, and any alteration in the pattern could be an indicator of chromosomal sensitivity to environmental factors, perhaps radiation. Dr. Joseph Wagoner summerized data at that same meeting on congenital anomalies in the Four Corners Area computed from the National Center for Health Statistics from analysis of birth certificates. This data showed elevated rates of birth defects in all the Four Corners states, particularly in areas of intense uranium mining and milling activity. For instance, in four South-eastern Utah counties where 92% of all Utah's uranium activity exists, the birth defect rate is 25.2 per 1,000 live births, while all other Utah counties combined show only 11.3 birth defects per 1,000 live births. The conclusion of the attendees of the conference was that the data presented was suggestive of a problem in reproductive outcomes in the Four Corners Area and that the problem warrants further attention[33].

More formal studies done in the past have shown birth defects and malformations in children from radiation levels near background. Down's Syndrome and severe mental retardation in children of Kerala, India have been correlated with naturally occurring high levels of radiation from thorium in the sands[34]. Congenital malformation rates in certain areas of New York State rather than in others and geological data show a correlation between areas with high malformation rates and locations containing natural material with high concentrations of radioactive elements[35].

In review, the above section on health risks from radiation lead to two conclusions:(1) radiation at low doses is much more hazardous than thought and follows a supralinear curve, particularly for Alpha radiation, which is the primary radiation in uranium milling activities. This raises serious questions about the adequacy of existing radiation standards used by the NRC and the State of NM to form the basis of these new regulations;(2) Preliminary studies indicate serious problems in areas of uranium activities in New Mexico which have not been taken into account in these new regulations and which must be followed up with formal studies.

Although we support the proposed radiation regulations presented here today, and feel they are long overdue, we feel the existing standards for radiation exposure need to provide an even greater margin of safety to workers, the general population, and future generations exposed to radiation from milling sources. We support a reanalysis by the NRC of the recent low level radiation studies in light of the new data on radiation doses at Hiroshima which form the basis of our current standards. We believe that such an objective review would lead to an even further reduction of radiation exposure and more stringent regulations than are being discussed today. Thank you.

Lynda Taylor

FOOTNOTES

1. Phase II - Title I Enginerring Assessment of Inactive Uranium Mill Tailings - Shiprock Site, Shiprock NM, 3/31/77 ERDA Contract No. E(05-1)-1658 by Ford, Bacon & Davis Utah, Inc.

2. Gamma Radiation Surveys at Inactive Uranium Mill Sites. U.S. EPA, 8/75.

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FOOTNOTES (CON'T)

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18. NRC Translation 520, "Radiological Assessment of the Wyhl Nuclear Power Plant, July, 1979.

19. "Cancer and Low Level Ionizing Radiation", Morgan, K.Z., Bulletin of Atomic Scientists, 9/78.

20. MacMahon, B., "Prenatal X-Ray Exposure and Childhood Cancer", Journal of the National Cancer Institute, 28(1962), 1173.

21. Bross, I.D., "Leukemia from Low-level Radiation", New England Journal of Medicine,287, p. 107 (July 20, 1972.

22. Burch, "Radiation Biophysics" from Principles of Radiation Protection, edited by K.Z. Morgan and J.E. Turner (NY: R.E. Krieger, 1973).

23. Ibid, Bross.

24. Bross, Proceedings of a Congressional Seminar on Low Level Ionizing Radiation, House, 94th Cong. (Wash., D.C.) Subcommittee on Helath and Environment.

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26. Royal Commission Report on the Health and Safety of Workers in Mines (J.A. Ham, Ed.) pp.78-84, 319-329. Min. of the Atty Gen., Province of Ontario, Toronto, Canada.

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28. Bross, Ibid.

29. "New A Bomb Studies Alter Radiation Estimates", Science, 5/22/81, Vol. 212, pp. 900-903.

30. For copy of report, contact Lynn Olcott, Director, Dine Center for Human Development, Navajo Community College, Tsalie, Arizona 86556 (602) 871-4381.

31. For copy of report, contact Don Calloway, Navajo Health Authority, Windowrock, Arizona 87515 (602) 871-4831.

32. For results of survey, contact Sarah Harvey, Director, Community Health Representative Program, Indian Health Service, Shiprock, New Mexico 87420 (505) 368-4340.

33. For copy of conference report, contact William Weiss, Chairman Dept. of Family Medicine, UNM School of Medicine, Albuquerque, New Mexico 87196 (505) 277-3253.

34. Kochupillai, et al,"Down's Syndrome and Related Abnormalities in an Area of High Background Radiation in Coastal Kerala, Nature, Vol. 262, July 1, 1976.

35. Gentry J., et al, "An Epidemiological Study of Congenital Malformation in New York State", New York State Health Dept., April, 1959.

June 11, 1981

WRITTEN TESTIMONY: G. THEODORE DAVIS, MD
c/o Box 4096
Albuquerque
NM 87106

To: ENVIRONMENTAL IMPROVEMENT BOARD
STATE OF NEW MEXICO

Re: Proposed additions to the present New Mexico Readiation Protection Regulations, as required of New Mexico by the US Nuclear Regulatory Commission

SUMMARY AND CONCLUSION

The author would strongly recommend the adoption of Section 3-300m and 3-300N, and all 11 criteria of Appendix A to Part 3, as adoption of these new guidelines is in the interest of public health, and fall under the category of "environmenal improvement." A discussion of some of the relevant concerns follows.

TEXT

A. 25 millirem rule:

It is an established radiation protection principle that all doses of radiation be kept as low as possible, as there has been no dose of radiation so low that it has been shown to be totally free of risk of induction of malignancy or genetic damage or other perncious health effect. Indeed, most risk estimates for radiation exposure calculated by the various National and International radiation standard setting organizations have been calculated based on dose response data from Japanese atomic bomb survivors. For years many criticisms about the adequacy of these data have been raised by Drs. Morgan, Mancuso, Bross, Gofman and others, for several reasons, but primarily because it appeared additional human data indicated that the Atomic Bomb survivor data significantly underestimated the risk. Some of these concerns are elucidated in a recent paper by Morgan(Comments on Cellular and Molecular Biophysics, Jan. 1980). Even members of the prestigious National Academy of Sciences Committee on the Biological Effects of Ionizing Radiation (BEIR Committee) were strongly divided on the issue of radiation risk assessment, and the controversy led Dr. Edward RAdford, who is chairman of the Committee, to withdraw his support for the final updated 1980 BEIR report, as he felt the risk was understated in the final report. A startling new development in the dosimetry estimates for the A-bomb survivors just reported in the May 22, 1981 edition of SCIENCE further implicates the currently used radiation risk assessment criteria as being overly optimistic, ie, the risk per exposre may be much greater than previously assessed. It appears the actual doses recieved by the survivors may be overestimated by a factor of 6 to 10. In other words, 1/10 of the previously estimated radiation dose is responsible for the excess cancers seen in A-bomb survivors. Radford now believes the 1980 BEIR report has been rendered obsolete, and Artbur C. Upton, former director of the National Cancer Institute, and an expert in radiobiology has stated that he agrees with Radford that the new data greatly strengthen the argument that there is no 'safe ' level of exposure to radiation, in that every incremental bit of exposure increases the chances of injury. In light of the fact that even background radiation (70-200 millirem, depending on location) causes cancer deaths, every effort should be made to limit exposures to radiation workers and the public from all sources in addition to background. The 25 millirem rule is a step in the right direction, but the continued failure to include radon and its daughters in this exposure is indeed unfortunate, if not outright irresponsible in terms of public health protection. Although the 25 millirem is not totally adequate, if exposures can be kept at or below this range, it is a goOd stop gap measure. In addition, as regards the very long term hazard posed by tailings, and associated sites, we could anticipate radiation doses over the years to literally thousands of individuals.

B. ASSESSMENT OF SELECTED TECHNICAL CRITERIA

CRITERION I. a. As stated in the introduction of Criterion I, the objective is to isolate tailings and associated contaminants from man and the environment during operations and for thousnands of years afterwards. Site selection as mentioned in a."-remoteness from populated areas" is an interesting but possibly useless concept. Probably hundreds of years ago the site of this hearing was "remote". The point is, any area permanently contaminated by uranium activity will uncontrolled within a few decades to centuries, and therefor pose risk to populations, unless actions are taken to segregate these land(or contaminated water) regions.

CRITERION 2. As above under I, it would be helpful to limit the number of contaminated sites as much as possible.

CRITERIA. 3 ,4,5,6,7. Since these criteria deal mostly with techniques to limit radiation exposure in general from environmental releases via air and water, I refer the reader first to the comments above about radiation risks (see 25 millirem rule), and the the text below regarding behavior of radionuclides released into the environment. Although not specifically addressed in the criteria, the probability of exposure of populations to internally deposited radionuclides via food, inhalation and water pathways is one of the major justifications to reduce all environmental releases.

All phases of the nuclear fuel chain release radioactive species into the environment, the species and the amounts dppend on the nature of the operation, and the reliability of environmental controls. Uranium mining and milling processes routinely release radioactive materials plus other toxic materials into the biosphere. Data indicate that responsible operations can limit releases, and that poor management, poor engineering, and lack of concern and responsibility can lead to disastrous results, like the United Nuclear Corporation Church Rock Mill Tailings Spill that occurred on July 16, 1979. This event, plus spills contaminating water supplies in Broadview and Murray Acres, testify to the urgent and imperative nature of establishing enforcable rules & laws and regulations to protect the public and the environment.

The fact that releases from the uranium mining and milling industry contaminate water supplies is well documented (for example, the paper by Tsivolglou, Stein and Towne, "Control of Radioactive Pollution of the Animus River," 32nd Annual Meeting, Federation of Sewage and Industrial Wastes Assns.; Dallas Texas, Oct 12-15, 1959), and these radioactive materials readily enter the food chain, and eventually reach humans.

Although many field studies have been conducted on the transport of various radionuclides into the food chain, many uncertainties exist in calculating accurately parameters of transport(Garten, CT., "A Review of Paramenter Values Used to Assess the Transport of Plutonium, Uranium and Thorium in Terrestrial Food Chains," ENVIRONMENTAL RESEARCH, 17, 437-452, 1978), and consequent dose commitments to human beings(Figure 1)

For example, a recent report prepared by the Department of Environmental Protection of the University of Heidelberg, and in part translated by the NRC (translation #520, 1978) entitled RADIOLOGIC ASSESSMENT OF THE WYHL NUCLEAR POWER PLANT, indicates that in some instances offical governmental guidelines have neglected to take into account the tremendous variability of nature in concentrating radionuclides into food stuffs. It is therefore possible that dose assessments based on environmental modeling may significantly underestimate exposure to internally emitting isotopes. This same theme appears in numerous other publications (eg, Bruland, Frank, and Teufel,"Transfer of organically Bound Radionuclides Through Foodchains to Man," IAEA SM 237/17, 1979). For Example, see the enclosed table #2, which shows the variability of transfer factors for the fission product Cesium, that depends on only one or many environmental parameters, in this case clay content of soil. The same principle would hold for uranium, and its daughters (see Garten ref. above).

Environmental and metabolic behavior of thorium is especially relevant to this discussion, and a brief review of this actinide follows.

Thorium is contained in uranium ore, and consequently in tailings waste in large quantities, as is radium. They are both daughters of uranium. Thorium is part of the Actinide Series (Figure 3) and shares some similar chemical and metabolic properties with other elements in the series, and is known to be highly carcinogenic (eg from thoratrast patient data). Thorium has the ability to change valance state depending of environmental conditions, and can be complexed into organic or non-organic molecules, taken up into the food chain, or contaminate water supplies, if released from uranium operations. (Thorium was released in curie quantities from the UNC Church rock spill into the Rio Puerco river of the west, a major water supply of hundreds of Navajo and their livestock). Thorium, like Plutonium, has a propensity to locate in the reticuloendothelial system and bone in animals and humans. Also, like plutonium, Thorium can assume various chemical valance states, from +3 to + 6. Larson and Oldham, (Larson and Oldham, "Plutonium in drinking Water: Effects of chlorination" Science 201, 1008, 9/15/78) reconfirmed the work of Weeks (radiation Research, 1959) that showed chlorination of water increased the absorption of plutonium from the gut by a factor of at least 1,000 (three orders of magnitude), apparently by altering the valance state of the plutonium from + to 3. Thorium would also be subject to valance changes like this, and thorium in chlorinated domestic water supplies might pose a significant risk of incorporation into the body, and resultant irradiation.

In short, the variability of the behavior in the biosphere of the various radionuclides released in the milling process, and the potential radiological (or chemical) toxicity to individuals exposed either through physical factors (air, particulates) and/or the food chain, certainly justifies the implementation of the criteria 3 to 7, in an effort to attempt to control releases and emissions.

COMMENT

It is clear that the agencies directly or indirectly involved in promulgating the new regulations (USEPA,NRC) have attempted to analyse a vast amount of scientific, medical and health data, and come up with satisfactory guidelines to protect the environment and public from chemical and radiological hazards. In light of the latest data on the overestimation of radiation dose to Japanese bomb[illegible] , and the probable underestimation of radiation exposures from isotopes in the food chain, the new regulations may not be conservative enough. Nevertheless, as a medical doctor concerned with public health, I urge the BOARD to accept the new regulations as at least a first step in regulating and effectively controlling an industry that thus far has contributed to significant health problems over the last four decades.

ADDENDUM

Some well known experts, notably R.D. Evans, have hypothesized that the study of radium-exposed persons shows the linear model of radiation carcinogenesis is incorrect, and that a "practical" and /or absolute threshold exists below which human radiation carcinogenesis does not occur. This concept is contradictory to the principles of radiation carcinogenesis and radiation protection of every national and international radiation protection organization. To address this concern (as I have heard Dr. Evans will be witness for the uranium industry at this hearing) I am enclosing two papers that discuss this issue. They are: Gofman and Tamplin, "The Question of safe Radiation thresholds for alpha emitting bone seekers in man," and G. Mems, "The risk of bone cancer in man from internally deposited radium."

G. Theodore Davis

G. Theodore Davis, MD 6/10/81

Figure 1

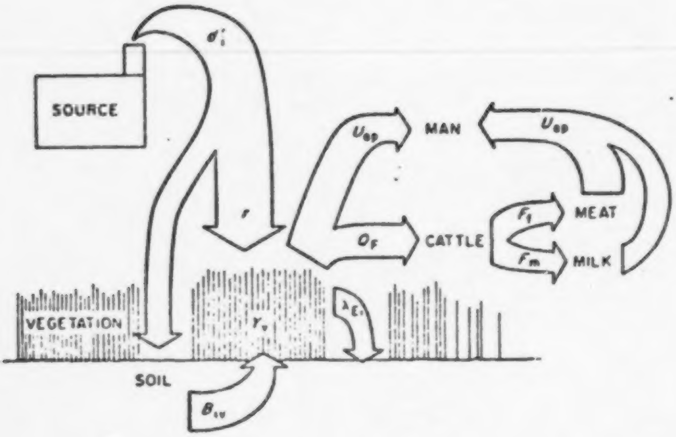

d_i'
SOURCE
U_{ap}
MAN
U_{ap}
r
MEAT
F_f
Q_F
CATTLE
F_m
MILK
VEGETATION
Y_v
λ_{E_i}
SOIL
B_{iv}

Fig. 1. Diagrammatic representation of terrestrial food chain transport of a radionuclide from atmospheric release to man. Important environmental parameters used to predict food chain transport include the deposition rate, d_i' (pCi m^{-2} hr^{-1}), fractional interception of deposition by vegetation (r), vegetation biomass, Y_v (kg m^{-2}), soil to plant concentration ratio (B_{iv}), effective half-life on vegetation, λ_{E_i} (hr^{-1}), consumption rate by cattle, Q_F (kg day^{-1}), forage to milk, F_m (day liter^{-1}) and forage to meat, F_f (day kg^{-1}) transfer factors, and the consumption of crops, meat, and milk by man, U_{ap} (in liter year^{-1} or kg year^{-1}).

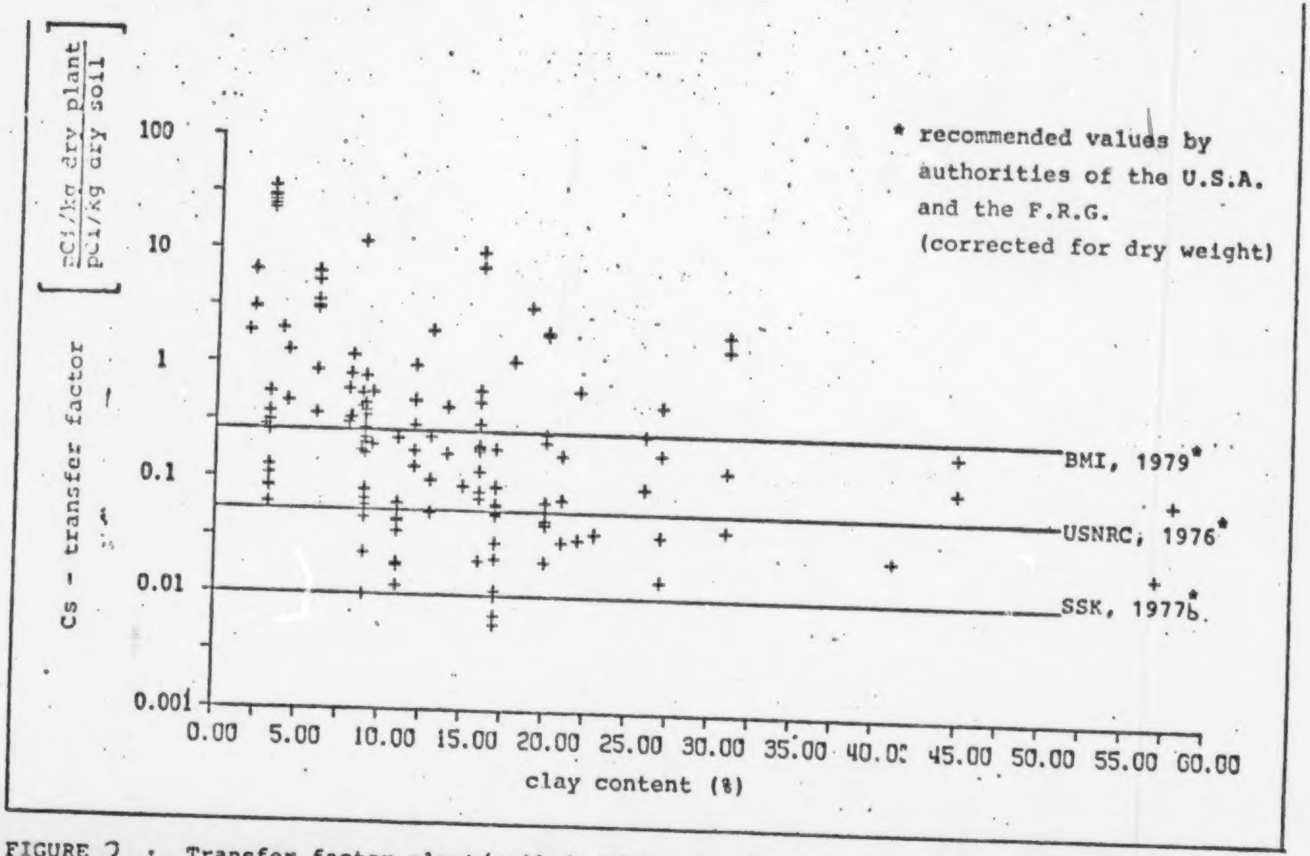
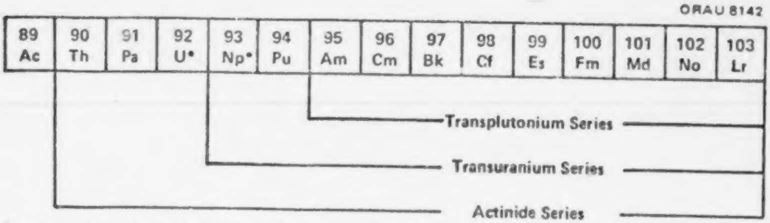


FIGURE 2 : Transfer factor plant/soil (pCi/kg dry plant : pCi/kg dry soil) for cesium against clay content in soil (%) (from: Franke,Ratka,van de Sand, 1978)

Figure 3


ORAU 8142
89 Ac
90 Th
91 Pa
92 U*
93 Np*
94 Pu
95 Am
96 Cm
97 Bk
98 Cf
99 Es
100 Fm
101 Md
102 No
103 Lr
Transplutonium Series
Transuranium Series
Actinide Series

* Incorporated uranium and neptunium should not be chelated.